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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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RESEARCH IN LAND AND PUBLIC UTILITY ECONOMICS

RICHARD T. ELY

CUSTOMER OWNERSHIP OF PUBLIC UTILITIES

RALPH E. HEILMAN

HOUSING IN THE UNITED STATES

JOHN M. GRIES

TAXATION OF PUBLIC SERVICE INDUSTRIES

HERBERT D. SIMPSON

PLACE OF TENANCY IN A SYSTEM OF FARM LAND TENURE

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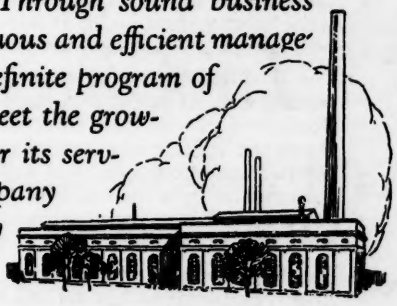

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Mileage electric transmission and distributing lines, 14,624.

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Construction budget for 1924, $35,253,000.

THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

JANUARY 1925

VOLUME I NUMBER 1

RESEARCH IN LAND AND PUBLIC UTILITY ECONOMICS

By RICHARD T. ELY

ECONOMIC research today is a social necessity. This conviction is based upon the evident fact that economic life in modern times is characterized by increasing complexity of relationships. The mechanism of supplying goods and services for the satisfaction of human wants is nicely adjusted, and the smooth functioning of the mechanism as a whole depends upon the soundness of these adjustments among its parts. Yet these economic relationships are frequently so obscure in their complexity that months and years of patient investigation are needed to study them and plan wisely for their improvement. Here is the opportunity as well as the need for research.

Research as an agency of human advancement is not new; it is as old as science. The superstitions which our early ancestors built up around natural phenomena gradually gave way to knowledge through the application of research methods. The interpretation of the movements of stars was magic until research workers made it into the science of astronomy. All through history we find sciences, both natural and social, emerging from the realm of magic and superstition as the result of research.

What is new is that research is coming to be one of the chief expressions of modern life, instead of being merely incidental to the real business of life. Perhaps it is not too much to say that in proportion as blind evolution has given place to self-conscious processes, in the field of the natural as well as the social sciences, research as a means of directing change has come to the forefront.

This recognition of research as the chief tool of economic progress is more general today than ever before. One need only compare the host of research workers and agencies at work today

with the handful of a generation ago to realize the prevalence of this conviction. Business firms and trade associations, labor unions, government departments, and many other groups are turning with greater frequency to research workers and agencies for guidance.

In view of this tendency toward research, it is somewhat surprising to note the comparative neglect of the study of the economic relationships arising from the ownership and use of land and the administration and regulation of public utilities. With the progress of economic science has come specialization—a segregation of particular economic relationships for special study. Thus labor, money and banking, and business management, for example, are dealt with as more or less distinct economic subjects. Only within comparatively few years have land economics and public utility economics in some places assumed a position on a plane of equality with other economic subjects. The retarded development of a scientific treatment of land and public utility economics is the more surprising in view of the fact that over half of the estimated wealth of the United States is represented by the value of real estate and public utility property.

The casual treatment which, until recently, has been accorded to these problems may be explained partly by the abundance of natural resources, in this country at least, and partly by the tardy realization of the importance of land and public utilities in modern economic life. "Go West, young man" used to be the advice given to those who felt that their economic opportunities were restricted. The free land of the West was for a considerable period in American life the seemingly glorious alternative, however much over-rated, open to ambitious men. For practical purposes the days of free land are gone, for better or worse. Our widely heralded abundance of untouched resources is not so easily found now as it was 50 years ago. The pinch of growing demand in relation to available resources is making itself felt and is finding expression in the wider appreciation of the fundamental importance of land and public utilities to economic well-being.

For our present purpose it will not be amiss to outline briefly the scope and importance of land and public utility problems and thus to indicate the objectives of economic research in this field.

Land Problems

First, there is a group of problems which pertain especially to the utilization of land. Land is found useful for a variety of purposes—building, cultivation of crops, forest growth, the extraction of mineral deposits, transportation—to name only a few. Of the resources available for use in these varied ways, how much land should be devoted to each use? Moreover, of the land suitable for agricultural use, for example, how much should be devoted to raising staple crops, to pasturage, to growing garden truck? Here is a problem of proportioning our resources to obtain the maximum economic results. It is a problem to be solved by the application of sound economic principles.

From the time of Malthus a great deal has been written, off and on, about the pressure of population on the supply of food. How rapidly should we extend or intensify the cultivation of agricultural land in order to feed our growing population? Here is the problem of apportionment from another angle.

The land frontier, both urban and rural, has always raised difficult prob-

lems, but probably these problems were never more insistent than they are today. There is tremendous waste of natural and human resources because of too great eagerness in extending the frontier. In the agricultural regions this means that men try to cultivate submarginal land, that is, land that can only be cultivated unprofitably at present prices of agricultural products and may be better suited for forestry or grazing. Inevitably financial loss and human misery result from such mistakes. The distress of farmers has been widely advertised of late. To what is it due? The selfish plots of the moneyed interests or of other groups in society are not the cause of this distress. Furthermore, neither the cause nor the remedy are to be found chiefly in politics. The underlying cause is the failure to apply economic principles or the incorrect application of economic principles. The evidence of this failure is found in the fact that the most appropriate use is not made of each kind of land.

How can the appropriate use be found? How can the submarginal land on the rural frontier be put out of agricultural use? A solution must be found by means of research methods. The problem requires a thorough investigation of the qualities of the soil, the condition of the market, the types of farming, the experience and ability of the farmer, the costs of marketing, and a great many other pertinent factors. In short, an economic survey (not simply a soil survey) and a rational classification of the land are necessary to the placing of each kind of land in its most appropriate use, that is, its economic use.

A similar waste of natural and human resources may be found on the urban frontier. Land is frequently taken from agricultural use and platted for urban lots long in advance of the real needs of the community. Those who invest in these lots are often people with small means who expect to reap a large return from the increment in value. But while waiting for the increment to develop, it is not an uncommon experience for these purchasers to see taxes, assessments for improvements, and interest sacrificed eat up the expected increment and far more. Meagre savings may thus be wiped out. A great deal of the land now lying idle in premature subdivisions is a monument to unfulfilled expectations. Economic research can contribute to the solution of the urban frontier problems a study of the needs of the growing community and an economic basis for a comprehensive city plan.

The utilization of urban land presents other problems of pressing importance. There are the questions, for example, of providing adequate housing facilities, of relieving street and traffic congestion which the increasing use of the automobile has brought, of furnishing adequate transportation facilities. To all these problems research contributes an understanding of the economic principles involved.

A second group of land problems arises from the ownership of land. To many people the increase of farm tenancy is alarming. Is tenancy, whether rural or urban, necessarily evil? Can landlord and tenant relations be improved so as to make tenancy an aid to ownership? How much tenancy is desirable?

Again, is the ownership of landed property properly distributed between public agencies and private individuals? One hears often that our timber and mineral resources are being exploited wastefully under private ownership. Undoubtedly it is true that our former-

ly vast timber resources have been mined to such an extent that now the country is faced with a deficiency with all that that means—increased prices, high building costs, and more restricted consumption. A remedy is sought in reforestation. Can that be accomplished more efficiently under public or private ownership of forest land? Here again we meet the problem of land apportionment, keeping in forest use the land which is suited for forest growth.

A third group of problems grows out of the valuation of land and the income from land. Why are land values high in proportion to yield? Is it true that landowners normally and regularly receive no super-gains? What are the costs that landowners necessarily have to meet in order to obtain an income from land? What is the relation between cost and income in utilizing land? Is land a good basis for credit? How much credit is it desirable to give to landowners or tenants and on what terms of interest and amortization?

The taxation of land presents other questions that are socially as well as individually significant. How much does the land contribute to the government? Is the tax burden that land carries too great or too small? What is the effect of taxation upon the utilization and ownership of land? Should land taxes be based upon selling value, as in this country, or upon income, as in other countries?

It is impossible even to enumerate all the problems revealed by a consideration of land from an economic and social point of view. They lead into almost every nook and cranny of our economic society; their solution is of vital importance to individual and social welfare.

The mistakes of the past in dealing with these problems are largely traceable to the failure to recognize the essential unity of land economics. Public policies with respect to agricultural land, for example, have treated this type of land as a thing peculiar and apart, when, as a matter of fact, the utilization of agricultural, forest, mineral, and urban land is characterized by a network of interrelationships. From an economic point of view each class of land is a part of a whole and the fundamental problem of the whole is the economic apportionment of the available natural resources among the different uses.

Fortunately, recognition of this essential unity is beginning to make itself felt in the framing of public and private land policies. Public officials, notably in the United States Department of Agriculture, are giving more attention to the economic interrelationships of land policies. Private agencies, like the National Association of Real Estate Boards and the United States League of Local Building and Loan Associations, are sponsoring economic investigations and education of their members.

Public Utility Problems

While the unity of land economics is being perceived, the intimate relationship between land and public utility economics is not so generally recognized. Yet if railways and local utilities had not developed, economics in the modern sense could scarcely have existed at all. The more and more minute division of labor, the widening of markets, the growth of cities, and the evolution of our complex exchange economy have grown out of, and have been dependent on, the development of transportation, communication, and mechanical power. To be more specific, the utilization of our national resources is controlled and

conditioned by public utilities. The value of agricultural, forest, and mineral products depends in large part upon their ability to reach markets economically, in other words, upon the continued functioning of transport facilities. Again, the collective supplying of water, light, sewerage, heat, power, and local transport has made possible the organization of production in our centers of population under the factory system. Any failure in these utilities would, if continued, disperse the population and force a reversion of industry to the handicraft stage when production took place in the homes.

Local public utilities are peculiarly affected by the city planning movement because they use public highways and require land in strategic locations. They are vitally concerned, therefore, in any apportionment of the city land area and in any zoning arrangements that condition future land utilization.

Moreover, land values on the frontier, especially the city frontier, may be created by public utilities. To the utilities an extension of the frontier may mean either increased business or a financial deficit. Thus public utilities are vitally concerned with a scientific subdivision policy.

In short, harmonious development of natural resources depends upon recognition of the interdependence of land and public utility economics. The public utilities are to no small degree the sinews of the modern economic organism.

Bearing in mind these relationships, certain outstanding problems are facing the public utilities and demanding investigation from an economic point of view. There is the problem of maintaining operating efficiency under regulation. Is it possible to develop standards of operating performance for the industries as a whole, and if so, what are these standards? How can these operating standards be combined with a regulatory program so as to furnish an incentive working continuously toward maintaining or improving them? Other problems grow out of the consolidation movement in both the transport and electricity supply industries. What are the economic limits of consolidations from the standpoint of operating efficiency and rate structure, from the standpoint of regulation and of correlation with other economic activities? In the electric railway field the problem of motor-bus operation is worthy of intensive study. Also the old problem of relief of congestion—street as well as traffic congestion—whether by means of the various forms of rapid transit or by applying some city planning measures or by a combination of expedients. Land planning and prosperity go hand in hand, and efficient public utilities are a link binding the two together.

These are questions that connot be solved adequately by rule-of-thumb methods which ignore the underlying economic principles. The elucidation of economic principles and their application to land and public utility problems is the task of research in this field. And the scientific performance of this task will contribute much to individual and social welfare.

Development of Research

As research has taken on added importance in the social sciences it has undergone two noteworthy changes. The principal research method of the older economists, such as Adam Smith, was individual observation and analysis. Research in the second phase of its development was carried on by pains-

taking historical study, also chiefly individual in character. About the third quarter of the nineteenth century, the statistical method came forward.

Statistical method aims primarily to study mass phenomena in their quantitative relations. As applied in economics, it makes use of the earlier analytical, qualitative conclusions, verifies and traces them historically, and then aims to project them into the future with the view of establishing trends in development that may serve as a guide in reaching conclusions. It is here that new fields for research lie.

With this change in method has come also a change in the working unit. The individual investigator was the working unit of research in the earlier phases; but now economic research has become cooperative, with groups of investigators cooperating on individual problems. This cooperative treatment has necessitated specially constituted organizations, such as the Institute for Research in Land Economics and Public Utilities, the National Bureau of Economic Research, the Harvard Bureau of Business Research, and the Northwestern Bureau of Business Research. Such research organizations are only an expression of the large-scale methods that have come in this and other fields.

Economic research must, of course, be built upon facts found by research agencies, such as the "plant" research of certain companies and the technical research which looks at land and public utility problems from an engineering point of view. But economic research does more than the other types of research agencies are in a position to do; it studies the fundamentals and relationships of all the complex problems of land and public utility economics. Its methods of analysis are statistical or quantitative as well as qualitative.

Economic research is of no avail if its results cannot be brought to the attention of those who can use the results. In that event it is of no social usefulness. Thus to be effective, research agencies must have means of publishing results. One means, which is employed by the Institute for Research in Land Economics and Public Utilities, is the monthly "house organ," called the *Institute News*. Another means is the publication of monographs; still another is the publication of books. Probably the most useful in point of effectiveness is the periodical journal, represented by this new quarterly JOURNAL OF LAND AND PUBLIC UTILITY ECONOMICS. It makes possible not only the publication of the results of researches as they are completed but also the publication of other articles which give the matured experience of those who are actually meeting the same problems in their business enterprises. The editors of the JOURNAL OF LAND AND PUBLIC UTILITY ECONOMICS desire to make it a medium for the scientific discussion of the problems in the field. It will not be a "popular" journal in the sense that other publications are popular; its readers will find in its pages the best scientific material that can be gathered together bearing on the problems that engage us. The Institute for Research in Land Economics and Public Utilities may not always agree with the opinions and conclusions of some of its contributors, but one believes that the best solution to any problem comes from a full and free discussion of the merits of both sides of the question. The editorial policy of this JOURNAL is best summed up as "that continual and fearless sifting and winnowing by which alone the truth can be found."

CUSTOMER OWNERSHIP OF PUBLIC UTILITIES

By RALPH E. HEILMAN

SINCE the armistice a marked transformation has been effected in the methods of financing public utilities. Prior to the war, public utilities, like industrials, were accustomed to obtain their funds almost entirely by the issuance of securities—bonds, notes, and stock, disposed of through investment houses. The newer method is to employ the investment bank only for the disposal of bonds and notes and to dispose of stock to the public, in the communities served by the utility, directly through the utility corporation.

This new movement is popularly known as "customer ownership." It derives its name from the fact that the utility sells its stock directly to the users of its service, in the communities served by it; although such sales are not necessarily confined to the users or customers. Direct sale by the utility to the public is the essence of the plan.

This movement is young, but already it is evident that it is one of large importance. It is important not only as a method of financing, but it possesses far-reaching significance economically, socially, and politically. It is too early to measure the influence of this movement on the supply of capital available for investment in utility enterprises, on the cost of capital, on absentee ownership of utilities, on public policy and on governmental relations. But that the results will be of vast importance in these directions cannot be doubted.

Extent of the Movement

Some idea of the magnitude of this movement can be obtained from the following facts. In 1883 there were 11 stockholders of the company which was the predecessor of the Commonwealth Edison Company of Chicago. In 1913 the Commonwealth Company had 2,045. In 1919, when the company first extended its invitation to customers to become stockholders, there were 7,000. In 1920 there were 15,000; in 1922, 28,000; and on August 1, 1924, 42,980 stockowners and, in addition, about 4,000 employees who are paying for stock in instalments. It had sold, on this date, about $25,000,000 of stock to new stockholders who are customers. The Public Service Company of Northern Illinois has a similar record. In 1919 it had 2,753 shareholders. Today it has 26,000 as the direct result of its sales activities in the communities in the northern part of Illinois, outside of Chicago, which are served by it. The Middle West Utilities Company and its subsidiaries had sold over $52,000,000 of stock on this plan, at the close of 1923, and its stockholders on that date numbered 54,000. The Byllesby properties adopted this plan in 1915. By the end of 1923, $46,994,900 of stock had been sold in this way to more than 88,000 purchasers. The Southern California Edison Company was one of the pioneers in this movement. In 1917 it had approximately 2,000 stockholders, mostly non-residents. At the close of 1923 it had over 65,000 stockholders, and had sold over $46,000,000 of stock since the installation of the customer-ownership plan. This plan was put into

effect on the Stone & Webster properties in 1919. By the end of 1923, approximately 15,000 security owners had been added, representing the investment of nearly $8,000,000. These are but a few instances. Numerous other utility companies are now operating the plan of customer ownership, with a large degree of success.

The electric industry has been the leader in this movement. One writer claims that between 200,000 and 250,000 investors were added to the number of owners of stock of electric light and power companies in the United States in 1923.[1] About $250,000,000 of stocks were sold by this industry under the customer-ownership plan in the same year.[2] The National Electric Light Association reports that in 1923 there were 156 electric companies disposing of junior securities in this way—these companies serving approximately 40% of the population of the United States, and their earnings representing 51% of the total gross revenue of all the electric light and power companies of this country.[3] In 1924 this number had increased to 185 companies. Interesting facts and data regarding the operations of electric light and power companies in the customer-ownership field, are given in the report of this committee for 1924.[4]

"Customer ownership" has taken its place as one of the definitely recognized methods of financing in the electric industry, as is indicated by the fact that the National Electric Light Association has its "Customer-Ownership Committee" to promote and encourage the movement.

Gas companies also have successfully disposed of large blocks of stock in this way. One of the outstanding accomplishments was the sale of 600,000 shares of common stock directly to 18,566 purchasers by the Consolidated Gas Company of New York City, the issue being oversubscribed four times. The telephone industry has also realized the possibilities in this field. The American Telephone and Telegraph Company has set up effective machinery to reach the public in the important cities served by its various affiliated companies. It reports that on June 10, 1924, its number of stockholders was over 315,000, with a total of 425,146 stockholders in the American Company and its subsidiary companies.

The introduction of the plan into the electric railway field has been slow, due to the unfavorable situation in which many electric lines found themselves as a result of war and post-war conditions. Rising costs, difficulties and delays in securing increases in rates due to unexpired five-cent franchises, competition from automobiles, jitneys, and the motor bus, made the position of electric railways difficult. But recently certain electric lines have undertaken to raise capital by this plan. The Chicago Rapid Transit Lines (operating the elevated system in Chicago) recently offered $5,000,000 "prior preferred stock" to the public. Of this amount, $1,000,000 was offered to the 5,800 employees. They subscribed for $1,300,000 worth. The first $3,500,000 of the remaining amount was taken by 13,000 individuals, an average of less than 3 shares per purchaser. In the

[1] Sikes, Raymond V. "Customer-Ownership Progress," *Forbes Magazine*, p. 236, May 24, 1924.

[2] *Doherty Investment Bulletin*, September 10, 1924, and *Forbes Magazine*, May 24, 1924.

[3] Onken, W. H., Jr., "Financing of Public Utilities," *National Electric Light Association Bulletin*, April, 1924, p. 206.

[4] See *Report of the Customer-Ownership Committee*, National Electric Light Association, New York, 1924.

electric interurban field the plan has been successfully used by the Chicago, North Shore and Milwaukee Railroad Company, operating a line between Chicago and Milwaukee.

More need not be said to indicate the extent of this movement. While at first the plan was looked upon with skepticism by leaders in the utility field, and with hostility by many investment houses and bankers, it is evident that the movement is well established and that "customer ownership" has become one of the established and accepted methods of finance in the utilities field. A movement which has reached such large proportions within such a short period, which has been so effectively promoted by the utilities, and which has met with such a cordial response from the investing public and from multitudes who were not previously regarded as a part of "the investing public," must rest on some real economic basis. What is the origin of this movement, what is the explanation for its surprising success up to date, and what is its significance?

Origin of the Movement

The introduction of customer ownership was primarily due to economic pressure. The World War and conditions following it made corporate financing extremely difficult. During the war period utilities had lagged behind in their construction programs because of high prices for capital, labor, and material. After the armistice, the need for large sums for expansions and for additions to plant and equipment was pressing. But it was difficult to dispose of securities on attractive terms. Indeed, money rates were so high that in many instances they were prohibitive of financing in the usual ways.

This difficult situation of the utilities was aggravated by the laws regarding taxation. Heavy income taxes and surtaxes drove many of the well-to-do class to make their investments in tax-exempt securities, issued by the states and other units of government. Many found it the part of wisdom to purchase a tax-exempt bond, rather than a utility security carrying a higher yield.

There were other difficult aspects of the situation. The price of labor, coal, coke, and equipment had increased tremendously. Corresponding increases in rates had not always been easy to secure from the state utility commissions and regulating bodies. Old franchise provisions in some cases blocked or delayed authorization for increases in rates. Often there were reduced earnings. Therefore, utility securities had in many cases become less attractive to the experienced investor than formerly. Further, the real need in many cases was for junior financing, in order that a proper capitalization structure might be maintained.

These and other factors, arising out of war conditions, combined to make it difficult for utilities to obtain capital in the former ways on reasonable terms. The situation required that new methods of financing public utilities be tried and new sources of capital supply be found, if the utilities were to provide the additions necessary to keep pace with the demands being made on them for service. It was for these reasons that the method of direct sale in the communities served was undertaken on a large scale.

The customer-owner idea had been discussed in the utility press earlier. In 1914 it had been introduced on the Western Coast by the Pacific Gas & Electric Company, which is credited with being the first utility to introduce

the plan. But at first there was little realization of its large possibilities. It was not until the pressure of post-war conditions was felt that customer-ownership plans were widely launched. While this plan of sales has brought with it many unforeseen effects on public relations, it seems clear that in most cases the impelling considerations leading to its introduction, during and just after the war, were financial ones. Doubtless the experience with the Liberty loans, which proved that the rank and file of the population may be looked to as an important source of supply of capital, was a contributing factor in convincing utility managers of the feasibility of the plan.

Special Characteristics of Utility Businesses

There are certain characteristics of public utility enterprises which render them peculiarly well adapted to this method of financing. One is their constant and continued need for new capital with which to meet the ever-enlarging demands for service. Obviously this is true in a territory with a growing population. But it is also generally true in a territory with a stationary population, because of the ever-increasing demands, new uses for the service, and the advancing standards of life. Indeed, demands for electricity, gas, and telephone service in most American communities seem almost insatiable.

As indicative of the tremendous capacity of public utilities to utilize additional capital, attention may be called to recent investments in the public utilities field in Chicago. Between the armistice and January 1, 1924, there was invested by the Insull utilities, in the Chicago area, $113,250,000. Of this amount, the various Insull companies spent $42,000,000 for new plants in 1923 alone. In 1924 their investment will be $46,000,000. Careful estimates indicate that over $1,500,000,000 of bonds, notes, and stock were sold in the United States in 1923 by local utilities.[5] Some of this was for refunding, but doubtless the major portion of the proceeds went into expansions of plant and equipment. Well-informed authorities in the electric field estimate that the needs of the electric light and power industry for additional capital, during the next decade, will aggregate between six and ten billions of dollars.

In short, the needs of progressive utilities for new capital are both large and continuous. "Why do the public utilities do so much new financing?" is frequently asked. Herein is to be found the answer to that question.

Where is this new capital to come from?

In former days, prior to the era of strict government regulation, such capital might come in considerable part from surplus earnings. Even today, the wisely managed utility will reinvest a portion of its earnings in betterments of the property. But obviously, under present principles of regulation, which limit earnings to a fair return on the value of the property, it is impossible to expect utilities to finance their entire construction programs from earnings. They must seek new capital. This procedure is usually justified by the fact that the increase in fixed investment will sooner or later produce a corresponding increase in earnings.

Another characteristic of utilities is that when new capital is required, ordinarily it is not all required at once. Construction work proceeds through the year. In fact, with many thriving utili-

[5] Onken, W. H., Jr., in *National Electric Light Association Bulletin*, April, 1924, p. 204.

ties it is always in process. Therefore, securities can be offered and sold at any time, both for cash and on instalments, and the proceeds invested as received. This means that small investors find additional stock is always available when they have completed payments on previous subscriptions. As they become educated to place their savings in this type of investment, they find the opportunity always open. This in turn strengthens the formation of the habit.

The familiarity of the purchasers with the properties of the utility has also doubtless been a factor of importance. Economists have long called attention to the fact that capital is more attracted to familiar investments than to unfamiliar ones. The fact that a plant is located in the purchaser's community, that he regularly sees the properties, knows about the proposed expansion or betterment, is familiar with the local situation requiring it, and knows the character of the management of the company—all these are factors of immeasurable importance in influencing the local investor of small means. His investment is more readily made for use in an undertaking at home than elsewhere. Particularly is this true when the investment is to be made in a going concern already established, with impressive and valuable physical properties. There can be no doubt that the instinctive desire to see the properties which represent one's investment, and the attendant sense of proprietorship in such properties, is, in considerable part, the explanation for the favorable response of small local investors.

Utilities have certain other advantages in the form of customer contacts. A monthly visitor is sent to every customer's home by gas and electric companies—the meter reader. There is also the telephone repairman, the motorman and conductor who come directly into regular contact with the users of the service. These employees have been trained as effective missionaries. The rendering of the monthly bill provides a convenient opportunity to bill the customer for his instalments due on stock. It also offers opportunity, at no additional postage expense, to circularize the customer regularly regarding the attractiveness of the company's investment offerings.

The Rôle of State Regulation of Securities

State regulation of utility issues has likewise greatly promoted this movement. Many of the states now have a utilities commission, or a regulating board (whatever its official title may be), clothed with wide powers of control over rates, service, accounting procedure, and the like, for all utilities within the state. Most, but not all, of these states have also conferred upon the regulating board the obligation to pass upon all issues of bonds, notes, and stock by utilities under its jurisdiction. In such states, the purposes for which the commission may grant its approval to new issues are usually specified in the statute. These purposes generally include refunding, the acquisition or construction of property, addition to plant or facilities, and improvements of the service. Such provisions mean that the utility which desires to offer its stock for sale must first petition the commission, must show the purpose for which the stock is to be issued and the manner in which the proceeds are to be used, and must convince the commission of the propriety of the issue and the terms of sale.

There can be no doubt that this state approval has conveyed confidence to

the investing public, particularly to the small investor. The newspaper announcements, pamphlets, folders, and salesmen generally all emphasize the fact that the stock of the utility company being offered for sale bears the approval of the state utility board or commission.

Of course, state authorization of utility issues must not be construed as a state guarantee for such securities. Nevertheless it does mean something and does convey to the purchaser a certain assurance. It presumably assures him that the purpose for which the issue is made is a proper one, that securities are being issued only to the amount reasonably necessary for the accomplishment of this purpose, that the proceeds will actually be used for the purposes specified, and that there is a proper capitalization structure. At least this constitutes the goal, when the laws are adequate and properly administered.

It cannot be questioned that state investigation and authorization of utility issues has conveyed such assurances to investors and customers in making their purchases. This relationship between customer ownership and state regulation would seem to be indicated by the fact that customer ownership has had its greatest and earliest development in states in which the commission is clothed with the powers above referred to, as, for example, California, Illinois, New York, and Wisconsin. The power to regulate securities was in most cases conferred upon the state commissions primarily for the purpose of "preventing stock watering." That the establishment of this machinery would aid in bringing about a much wider diffusion of utility ownership and would open to the utilities a new and undreamed of source of capital supply, was probably never anticipated. Yet precisely this seems to have been the result.

Publicity and Sales Methods

While the above features inherent in the nature of public utilities have given them great advantages in promoting the wide-spread distribution of their stock, they do not suffice to account for the phenomenal development of the movement. This cannot be entirely explained without reference to the publicity and sales methods which have been employed by the utilities.

These methods have been carefully planned and thoroughly executed, and have proved astonishingly effective. The publicity used has been of such a character as to make a strong appeal to many of the fundamental instincts—pride, possession, thrift, civic spirit, and parental affection. "Invest in Property You Can See," "Make Your Dividends Pay Your Light Bill," "Watching Your Nest Egg," "Two Incomes for Every Family," "Investments That Endure," "Your Child's Future," "Taking Our Customers into Partnership," — these are typical of the slogans which have been coined to help popularize the utility offerings. Generous use of billboard and advertising space in the newspapers published in the communities served are also a part of the program.

Ordinarily most of the sales are made by employees who perform this work in addition to their regular duties. All employees who desire to sell securities are usually given the opportunity to do so. The character of the stock and its terms and provisions are carefully explained to these employees in meetings. A large dinner or banquet frequently is held to launch "the campaign." Teams, committees, or groups are formed, either by departments or otherwise, with

the necessary officers—majors, captains, lieutenants, and the like. Commissions are paid to employees on all sales, in addition to their regular salaries, ranging from $1 to $2 or $2.50 a share. All the usual features of sales contests are employed—daily reports, competition between departments, prizes to winning teams, and bonuses on all sales exceeding fixed quotas. The number of employees who voluntarily respond to this arrangement is surprising. For example, in May and June of 1924, during a special campaign by the Commonwealth Edison Company of Chicago, over 4,000 employees sold stock—approximately 50% of the entire payroll. This experience is not unusual.

The use of employees as stock salesmen has many advantages. It develops their interest in the company and its welfare. It develops *esprit de corps*. Many people, particularly among the small-saver class, are more likely to buy from them than from professional stock salesmen, of whom they feel afraid. The acquaintances of the employees are, in large part, among the salaried, wage-earning, and small business classes, who constitute prospective purchasers. The use of employees as salespeople is doubtless one of the most effective devices for reaching the rank and file of small local investors.

A plan frequently used, particularly by the large companies, is the establishment of a separate stock sales department with a manager and a corps of professional salesmen engaged in pushing stock sales continuously, together with the supplementary use of employees as salesmen during each special campaign or intensive "drive." It is found that these two methods strengthen and reenforce each other.

The instalment feature makes the purchase attractive to many investors. The purchaser is usually given his option of buying for cash, or on 10 to 12 monthly instalments. Yet the proportion of those who buy on the instalment plan is not so great as might be expected. Examination of the sales made by companies operating primarily in larger urban communities indicates that the percentage of sales made on the deferred payment plan ranges from 25% to 50%. The average percentage of sales made on deferred payments by the 185 electric companies above referred to was 34.6. Doubtless this percentage would be larger were it not for the fact that employee-salesmen are ordinarily paid a larger commission on sales for cash than on instalment sales.

The companies which have achieved a position of leadership in this field have not been content with making the original sale. Regarding the first sale as but the beginning, unique methods have been developed to deepen the customer-stockholder's interest as a prospective purchaser of more stock. Some companies regularly organize inspection trips of stockowners through their local plants, thus enabling the investors to see where their money goes. Stockholders are kept informed of important developments by well-directed publicity. Several of the largest companies broadcast the proceedings of the annual stockholders' meeting and the president's annual address and report.

Types of Securities Offered

The type of security offered under the customer-ownership plan deserves some comment. In a few cases, bonds have been successfully marketed in this way. But this is unusual. While public utility bonds generally possess a high degree of security, their yield is ordinarily not large enough to attract the

class intended to be reached. Generally the plan is confined to the offering of the company's junior securities. Preferred stock carrying a dividend rate of 7% to 8% has been the most usual type offered. The Customer-Ownership Committee of the National Electric Light Association reports that during the past year a number of large companies have met with success in selling their preferred stock on a 6% basis. Common stock is sometimes used. Of course, if the company has but one class of stock, this is offered. The Commonwealth Edison Company of Chicago, which has but this one class of stock, recently disposed of a large block of common shares in a two months' popular campaign. The Public Service Company of Northern Illinois, in 1922, successfully introduced the "no-par-value stock" into the customer-ownership field by the sale of 44,150 shares at $93, having no par value, but being in all respects on a parity with the common stock of the company, which has a par value of $100. In view of the fact that "no-par-value stock" had only recently been authorized by the Illinois statutes, this was a remarkable feat in popular education. The Chicago Rapid Transit Company recently introduced a novel plan in bringing out a special issue of "prior preferred" stock for popular sale, on which the dividend rate is 7.8%, payable monthly at the rate of 65 cents per share. Generally speaking, it would seem that preferred stock is best designed for the purposes of customer ownership. The dividend rate can be made attractive, and the security is prior to subordinate issues. However, it is difficult to generalize on this subject since the decision regarding the type of security to be offered must depend on the financial situation of the company.

Results of Customer Ownership

What are the most important results arising from this new method of financing?

From the standpoint of the utility corporation, there are certain obvious advantages. It opens a new source of supply of capital. It offers a means of junior financing which will, to a considerable extent, make it possible to keep the debt down and to maintain a properly balanced capitalization structure. At the same time, when it operates through the sale of non-voting preferred stock, it is a method by which it is possible to secure junior capital and to retain the management control in the hands of the present owners of the common stock. This consideration may prove important; for in many well-managed companies the success is contingent upon the maintenance of competent, experienced, and capable management.

Furthermore, this new source of capital makes it possible to finance at a minimum cost. Entirely aside from any other advantages, this method of financing is an economical one. Probably the normal cost of disposing of stock issues through the usual channels is 6 to 8 points or even more. The actual costs to the utilities of customer-sales are generally much less. These costs show a considerable range. The commissions paid to employees vary from $1 to $2.50 per share; the total sales costs, including advertising, postage, and other indirect costs, are reported by various companies as ranging from $3 to $5. The 185 companies using this plan in 1924 report through the National Electric Light Association an average selling cost of $4.60 per share. Of course, all such economies, in the long run, redound to the advantage of the consumers as well as the owners.

There are other advantages of a financial character. The credit position of a company is likely to be strengthened by the fact that a large number of people own its stock. This will prove true so long as the company is well managed and maintains a satisfactory dividend record. Under such conditions a large number of stockholders and a public well informed regarding the company's finances and standing means a strengthened credit position.

A wide-spread distribution of shares exercises a stabilizing influence on the market value of such stock. Manipulation for the purpose of depressing or inflating market values becomes more difficult when the number of stockowners runs up into many thousands.

There can be no doubt that this movement is destined to exert an important influence on the public relations of utilities. The relations between the utilities and the communities which they serve will inevitably be influenced by the fact that a substantial group of individuals have a stake in the utilities providing the service. By critics it is claimed that the plan is only a clever subterfuge whereby utilities hope to create sufficient favorable sentiment to avoid proper and reasonable regulation and control. It is doubtful whether any such purpose will be accomplished. The typical consumer is not likely to be more tolerant of poor service, inadequate facilities or unreasonably high rates, because he owns a few shares of stock. On the other hand, he may prove more likely to make his protest vigorous, because of his sense of proprietorship. But it can scarcely be doubted that if the service is adequate, and the rates and the treatment of customers reasonable, the plan should enlarge a utility's good-will.

It will increase the intelligent interest of the community in the affairs of the company. A wide-spread dissemination of information regarding the utility's affairs, finances, and management is the inevitable result of the plan. This will lead to appreciation of the fact that although not every rate schedule sought by utilities has been a proper one, neither is every reduction in rates advocated by politicians or office seekers a justifiable one. A better understanding of utility problems by more citizens inevitably leads to more wholesome and satisfactory relations with the community—providing the utility is well and capably managed, with due regard for the interests of the public.

It is not unlikely that this movement will sustain a relationship to efficiency of management. When there are many stockowners in the community, each feeling his personal stake in the success of the enterprise, the management is more likely to exert itself to maintain dividends, and at the same time to render a service satisfactory and pleasing to the community, than might be the case with the property dominated by absentee ownership.

To the investor, likewise, the plan brings important advantages. To the salaried, professional, or wage-earning saver, the plan offers an important opportunity for investment. The opportunities presented to this class to make investments which yield a substantial return, which can be acquired in small units, and which are reasonably safe are extremely limited. While the shares of utility companies do not possess the same high degree of security as government bonds and municipals, they are, doubtless, under adequate state supervision, the safest type of stock offered on a large scale to small purchasers. Up to the present time, so far as I have been able to learn, there has been no

default of dividends on any utility issue disposed of under the customer-ownership plan.

From the social point of view this movement has important bearings. The economic loss to the nation each year through the sale of worthless securities is in the uncounted millions. Most of the victims are people of small income, unacquainted with investments. Through "blue-sky" laws and similar measures, this loss is being reduced annually. The customer-ownership movement should prove an additional influence in the reduction of this loss. For while it is not to be expected that it will transform the cupidity of human nature, or eliminate the "get-rich-quick" desire, it does provide the small saver with an opportunity for a legitimate investment, with a reasonable security and attractive return. And it will do much to educate this class regarding the existence of such an opportunity, and to encourage them to avail themselves of it. Furthermore, a very great service is being rendered by utilities in making possible this form of systematic saving and investment on a monthly basis. The utility businesses are peculiarly well adapted for instalment sales since, as already pointed out, their need is for a regular flow of new funds to take care of construction work in progress.

It is not unlikely, therefore, that in the near future our utility enterprises will take their place as public servants in a new way—as thrift institutions.

Necessary Safeguards

A few observations regarding the future of this movement may not be amiss.

No utility should embark on a program of customer ownership unless it is reasonably certain that it will be able to maintain dividends on the stock, under any circumstances which may conceivably arise. This is apparently recognized by the Customer-Ownership Committee of the National Electric Light Association which, in its report for 1924, says: "The committee feels that conservatism should always be exercised and that every care should be taken to safeguard securities issued in this manner to make sure that their future and stability are amply secured in every way." Stock should not be put out under this plan if there is any likelihood, on the most conservative basis of calculation, that the company may be compelled to pass or reduce dividends. Indeed, the wide-spread sale of stock to customers in a very real sense transforms dividends into "fixed charges." This is, of course, not true legally, but it is true "psychologically." For failure to maintain the established rate of dividends would transform the company's local stockholders from friends to critics and enemies. The causes necessitating such action would be difficult for the small stockholder to understand. Explanations would be greeted with skepticism. Suspicion and hostility would be aroused. The result would prove disastrous to the utility's public relations.

The development of this movement points to another essential. At the present time there are 47 states with utility commissions or regulatory bodies, operating under various names and titles and with varying jurisdiction. Of these commissions, 25 have the power to supervise the issuance of securities. The other 22 commissions do not have such authority. Most of the latter group regulate rates and service and other miscellaneous matters, but do not have power to pass upon security issues. The states in which the authority of the

commission does not include supervision over securities are Colorado, Connecticut, Florida, Idaho, Iowa, Kentucky, Louisiana, Minnesota, Mississippi, Montana, Nevada, New Mexico, North Carolina, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Utah, Washington, West Virginia, and Wyoming.[6] The growth of this method of direct sales to the small investor brings with it the necessity of establishing rigid supervision of utility securities in every state. This is desirable both for the protection of investors and of utilities.

The desirability of such control was pointed out by the Committee on Public Service Securities of the Investment Bankers Association of America, which, in its 1923 report, said: "When administered with the broadest powers and in a judicial manner, state-wide regulation of public utilities has been conclusively proved in the opinion of your committee to afford the best guarantees which investors can have in this country for a maintenance of that integrity of investment necessary for a ready flow of money into the business. Where such conditions do not exist we find lack of development of the business or higher costs of money or both—conditions which adversely affect the costs of service to the consumer. . . . Your committee recommends, therefore, that members of this association urge, wherever lacking, that the state commissions be vested with authority over the valuation, rates, services, and capitalization of privately owned plants and that there be required and published full financial reports of operation."

Utilities are already actively engaged in distributing stock in some of the above-mentioned states which exercise no adequate control over the issuance of utility stock. So far as the author knows none of this stock is of questionable character. But the fact remains that the same safeguards have not been thrown around its issuance as in the other states. The establishment of adequate supervision and regulation by all the states, if properly administered, would go far towards safeguarding securities issued under the customer-owner plan and to accomplish for shares so distributed the objective stated above by the Committee on Customer-Ownership of the National Electric Light Association "to make sure that their future and stability are amply secured in every way." This suggestion for the establishment of such nation-wide supervision should meet the approval and endorsement of every well-wisher of customer ownership. The present condition constitutes a real danger to the future of the movement. For the wide-spread distribution of a few unsound issues would go far to discredit the entire movement. It is therefore to be hoped that the condition above pointed out will be remedied soon.

To summarize: The result of this movement has been to open up a new and vast reservoir of capital to utilities. To draw upon this source of supply, under appropriate circumstances, will prove economical financially and advantageous in other ways. When customer ownership is properly administered by a capable management, possessing public confidence, and operating under adequate regulation, this new reservoir is likely to prove adequate, in many communities, to provide the major portion of that capital which must be obtained for construction programs through the issuance of stock.

[6] See "Report of Committee on Public Service Securities," *Proceedings of the Twelfth Annual Convention of Investment Bankers Association of America*, October, 1923, p. 118.

LAND OWNERSHIP IN ENGLAND SINCE THE WAR

By SIR HENRY REW

THE political and economic repercussions of the war have been felt throughout the world. Their effects have been most severe in industry and commerce, but agriculture has been almost equally disturbed. Agricultural land which, under normal conditions, is the most stable of all forms of property, has during the past few years been subjected, in many countries, to violent changes both in value and ownership. The economic factors which have affected values have been, in a large degree, those common to property of all kinds in all countries. Political factors affecting land ownership have been especially powerful in Southeastern Europe where the arbitrary action of the State has forcibly redistributed large areas of agricultural land. Even in countries where drastic land legislation of this nature has not been adopted, political action has had a disturbing influence.

The English land system has always had a special interest for students of economic history in general and of land economics in particular. It has gradually developed throughout nearly a thousand years, and has adapted itself to the changing conditions from one century to another without any revolutionary break in its continuity. The trinity of classes—landowner, farmer, laborer—is characteristic of the system now as it was, in substance, at the Norman Conquest. The status of each class has altered and their mutual relationships are very different, but their economic relationship to the land is fundamentally the same. Under the typical English system the landowner provides the land and permanent equipment, the tenant provides working capital and management, and the laborer provides manual work. This arrangement is, of course, not universal. A considerable proportion of the agricultural holdings are "family farms"—that is, they are of such a size and character that the farmer is able to dispense with hired labor. If he is the owner of such a farm, he combines in himself the three interests and is in the position of a peasant proprietor. Larger farms, on which hired labor is required, are sometimes owned by the occupier, who thus combines the functions of landowner and tenant.

The total extent of land devoted to agriculture in England and Wales is 25,943,000 acres. Of this area 6,273,000 acres were in 1923 occupied by the owners. Approximately, therefore, 20,000,000 acres, or 77% of the agricultural land, are occupied by tenants. The number of holdings was 411,673 and of these, in 1923, 87,900, or rather more than 21%, were owned by the occupiers. It will be seen, therefore, that the number of tenant farmers is about 324,000.

The number of agricultural laborers employed in 1923 was 772,387. Of these, 625,300 were regularly employed all the year round, the remainder being casually employed at busy seasons.

The number of landowners, not themselves farming their land, is not accurately known. The size of their estates varies widely. Many own only a single

small farm while others, who form what may be properly termed the landowning class, own numerous farms of various size. Some of the large estates comprise several thousand acres and embrace a score or more of farms. But it is evident that the total number of owners who let their land to tenants is relatively small. If it were assumed that the average size of estates was 1,000 acres, the total number of landowners would be 20,000. It may be conjectured, on a liberal estimate, that the number is not more than 25,000.

The effects of the war have been very severely felt by English landowners. By no class in the community was the blood tax more freely, or more fearfully, paid. By tradition, rooted in the far-off days when the lord of the manor held his land from the Crown on terms of military service, the sons of the squires formed the backbone of the commissioned ranks of the regular army. There were very few manor houses which did not cherish long memories of generations who had served their king and country in bygone wars. Thus when the little British Army was sent across the Channel in the first days of the war and by holding back the encircling German invaders on the French flank made the battle of the Marne possible and saved France from imminent destruction, its officers were mainly drawn from old homes on the countryside. The fight they fought and the way they died are writ large in history. And at the first call for volunteers the landowning class made prompt and unanimous response. They were foremost to prove that the old traditions of service were as potent in the twentieth century as in the past.

Thus it was that the brunt of the deadly struggles of 1914 and 1915 fell on the men of the manor house and the heaviest toll was taken of their class. Hundreds of country homes were desolated by the loss of all their sons, and when the war was over there were many agricultural estates to which no direct successor was left.

This wholesale sacrifice of their sons was endured by the landowning class proudly and unrepiningly. It silenced, for this generation at least, those who had, in the past, scoffed at them as decadent and parasitic. In their country's need they were tried and not found wanting.

If English landowners bore their full share of the sorrow of war, they have also suffered materially more, probably, than any other class. Enhanced prices of agricultural produce brought no benefit to them, for farm rents were not raised during the war. The burden of war taxation fell upon them with unmitigated force. Many of the large estates have charges upon them of fixed amounts, some of a personal nature such as annuities, others in the nature of deferred payment of the cost of the improvement or maintenance of the property.

It is not surprising that under these circumstances those owners of agricultural estates who had no other substantial sources of income found themselves at the end of the war not only in straitened circumstances but in financial difficulties.

Then came the feverish and disastrous "boom" and the value of land rose rapidly with the general inflation of prices. The opportunity presented itself to embarrassed landowners to put their estates on the market and to realize prices of which they had never dreamt. Many were forced, others were tempted, to sell. There were plenty of eager buyers, mainly of two classes. Tenants, fearful of possible eviction by a new

landowner, purchased their farms which in many cases they and their forebears had occupied undisturbed for generations from the "old family." War profiteers—the economic excrescence, in every country, of the world's agony—competed for land as the recognized stepping-stone from obscurity to social status. In some instances whole estates were sold intact and the change was merely that of one owner for another. The change perhaps implied a personal tragedy. A family deeply rooted for generations on the land, with all the associations clustering around its age-long settlement on the countryside, was displaced by strangers whose qualification to assume the obligations of the position was based only on the recent acquisition of wealth. Such incidents have been common in the past. The replacement of the impoverished squire by the successful city man is the theme of countless plays and novels in English literature. In the post-war boom this familiar process occurred not in isolated instances at infrequent intervals but on a wide-spread scale affecting many districts.

In so far as the sale of estates involved only a transfer of ownership from one man to another it did not affect the interests of the community or make any change in land economics. Its reaction was personal, not public. It may incidentally have been beneficial to the public interest by the introduction of new capital in the equipment and development of estates. English agricultural land has been made what it is—reclaimed from the waste, laid out in farms, with homesteads, buildings and cottages, drained and fenced—by the outlay of private capital by the landowners of successive generations. From time to time capital accumulated in commercial and industrial enterprises or resulting, as in the case of several famous estates, from enhanced values of urban property, has been lavishly spent in the improvement of estates and the development of agricultural land. The nation has benefited by this expenditure, which has made the land a desirable possession and a great national asset.

In so far as the post-war sale of estates resulted in their division, the effect has obviously been to increase the number of landowners, and particularly to increase the number of occupying owners. This wider distribution of the land is, in itself, an advantage to the community. Before the war the number of occupying owners of farms was about half the present number. It may be roughly estimated that the owners of agricultural land have increased by about 50% since 1914, and that, including farmers who own the holdings they occupy, the total number is approximately 100,000.[1]

The fact that the ownership of agricultural land in England is now distributed among a larger number of individuals is politically and socially significant and advantageous. From the time when the Barons extorted Magna Charta from a reluctant king down to the passing of the Reform Act nearly a century ago the political power of the territorial magnates was dominant. Some remnants of their influence may still be found in the villages, and in the House of Lords the last vestiges of their ancient prerogatives are enshrined. But the day of their political power as a class has gone forever, and such influence as individual landowners exert on public affairs is due to personality and not to prestige.

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[1] There are also a large number of owners of urban land, including hundreds of thousands of individuals who own the house and garden they occupy.

English landowners are now on their defense.[1] They are called upon to justify their existence. The Labor Party are pledged, if they ever obtain power as well as office, to expropriate the owners of agricultural land. The present Labor Government have no power to carry out their program, and can only remain in office by adopting the policy of the Liberal Party, who control the political situation. So long as this position continues, nationalization of the land remains the aspiration of a Party impotent to achieve it. It may be added, as the personal opinion of one who has contested a rural constituency at two General Elections, that a serious attempt to carry out the policy of land nationalization would split the Labor Party in twain and would restore hundreds of thousands of voters in the rural districts, who have adopted the party label of Labor, to the ranks of Liberalism which they have formally left without changing their political opinions.

Meanwhile English landowners are not only increasing in numbers but are generally taking a more serious view than many of them have done in the past of the responsibilities of their position. English agriculture owes very much to the leadership of landowners from Coke of Norfolk onwards, and the spirit which inspired such leaders is nowadays wide spread. The power of the landlords to influence the farming of their tenants has been greatly curtailed by recent legislation. Tenant farmers now are not only insured full compensation for all improvements effected by them, but also have secured liberty to cultivate the land in any manner which they consider most advantageous to themselves. It cannot be denied that in some degree the guarantees for the maintenance of the fertility of the soil have been weakened and that the standard of farming depends more than ever on the capability of individual farmers. Nevertheless, although they have less direct power, landlords can still exert considerable influence. To do so, however, they must equip themselves with the necessary practical and scientific knowledge. This they are doing. At our public schools and universities the younger generation of those who will duly succeed to the ownership of agricultural land are obtaining the necessary training for the positions they will occupy. An indication of the keenness with which they are doing so came to my notice recently, when I acted as examiner for a "Land Prize" offered at one of our most ancient and famous public schools. All the papers submitted showed a remarkable degree of intelligent study by the boys (many of them heirs to estates) of the economics and practice of agriculture.

It is not only that landowners are realizing more generally the responsibility resting on them for the economic use of the land they own, but many of them are now themselves undertaking the farming of their own estates. The distinction between a farmer who purchases his farm and a landowner who farms his estate may, perhaps, to those who are unfamiliar with the conditions of the English countryside, appear subtle. It is nevertheless real and well recognized. Many instances might be cited of landowners, whose predecessors were content to let their land to tenants and delegate the management of the estate to an agent, who are themselves assuming control of the farming and are proud to call themselves farmers.

By such men, and by those who follow their example, the position of English landownership will be securely en-

[1] EDITORIAL NOTE: This was written before the general election in England.

trenched against the attacks of political theorists. The absentee landlord who brought about the revolution of the Irish land system and his own expropriation is happily unknown in England. The landlord, who, while living among his own people, took little personal interest in his land, except as providing opportunities for sport, is rapidly disappearing. The present generation of landowners are facing bravely and energetically the economic difficulties of the times and are accepting resolutely the responsibilities of their position. Struggling under a heavy burden of taxation, which falls with especial severity on landowners, reduced to a lower standard of living than that enjoyed by their predecessors, and facing unknown difficulties in the future, the English landowners of today who have clung to the land entrusted to them may well claim the respect and admiration of all who are concerned in the progress and development of agriculture in the British Isles.

HOUSING IN THE UNITED STATES

By JOHN M. GRIES

HOW are our people housed? By what standard shall we judge our housing? Is a house without a bathroom unsatisfactory? If so, a very high percentage of our rural homes must be counted out. If we judge by light and air, then many of our city houses are unsatisfactory. If privacy is essential, we must reject many more houses.

From the standpoint of health every one in the United States should live in a well-lighted, well-ventilated, and sanitary dwelling. This dwelling should also furnish the necessary protection from the weather. While such protection is important in the warm climates, it is especially important in the more rigorous northern climate. From the social or moral standpoint each family should be able to live by itself in a house or apartment with adequate living, working, and sleeping rooms.

Housing conditions in the United States as a whole are fairly good when contrasted with those of other countries. There are, however, several million families living in quarters which are neither adequate from the standpoint of health nor conducive to good morals. The causes of this situation and its cure constitute an important problem of national welfare.

Minimum Housing Standards

At present there is no minimum standard established for a habitable dwelling; nor is there any theoretical standard that is generally accepted as a minimum. If we accepted the minimum standard of some of our housing experts, the houses of more than one-third of the families in the United States would fall below this standard. Some authorities would establish different standards for city and country, and also for different climatic conditions.

The influence of housing conditions on health and morals needs no discussion. Good housing and home ownership tend to produce better citizenship; no single factor will do more towards maintaining a higher standard of civilization and a healthful political condition.

If the American people believe that good homes form the basis for a contented population and that unsanitary houses are bad, they must take a keener interest in the effort to have better homes at lower cost, because hundreds of thousands of families in the lower income groups are poorly housed at the present time.

The housing situation in the United States is never static. The annual growth in population calls for the construction of many thousands of new dwellings each year. The expansion of business districts in cities forces large numbers of families to seek new homes. The average number of persons in each "home" or housekeeping unit grows smaller with each succeeding census. The size of living quarters is now decreasing. The wide ownership of automobiles makes possible residential development in districts that formerly were too inaccessible. Changes in the organization of the construction industries, and the results of research in building practice and the use of building materials, might easily lead to such

economies in building costs as to make much of our present-day construction obsolete.

The forces at work can be influenced to a marked degree by direct and indirect activities of governmental and private agencies. Some of the opportunities to mitigate conditions present themselves on a national scale, while many more are primarily local in their origin and application. Financing of home-builders, for example, is ordinarily capable of solution within each city, though there seem to be some exceptions. Certainly one of the most important aspects of the situation is the need for a policy, framed with the public point of view, of using the land within a city and its environs. This, as will be shown later, involves carefully worked out city planning and zoning, careful control of subdivision development, the provision of water, sewerage, and public-utility facilities with a view to real economy in the long run, and, in short, the provision of a sufficient, but not extravagant, amount of developed land available for home building. Such basic facts as are being determined by the Institute for Research in Land Economics and Public Utilities will be most helpful in this connection.

Present Housing Situation

In 1920 the population of the United States was more than 105,000,000, made up of different races and many nationalities. The economic status of the population varies widely, including not only the pauper in the institution but also those who occupy mansions. Moreover, differences in race and nationality will continue to produce variations in our housing conditions.

How rapidly the need for homes has increased is shown by the following table giving the urban and rural populations for the last four decennial censuses:

TABLE I—INCREASE IN URBAN AND RURAL POPULATION, 1890-1920

Year	Total	Urban	Rural
1920	105,710,620	54,304,603	51,406,017
1910	91,972,266	42,166,120	49,806,146
1900	75,994,575	30,380,433	45,614,142
1890	62,947,714	22,298,359	40,649,355

The urban population has increased by 143% since 1890, which means that, allowing for the razing of old buildings, at least three homes out of every five in our cities have been built within the last 30 years.

Dwellings, as defined by the Bureau of the Census, include the fine residences along the North Shore of Massachusetts and all along Fifth Avenue, the shack on newly irrigated land in the West, the large apartment house, and the old canal boat used by a family for a home. Regardless of the economic status of families, their taste as to design or their need for space, houses will differ somewhat with the climate. Houses in the warmer parts of the United States do not require the careful attention in building that is necessary in the colder parts of the country. The differences in types of dwellings due to climate, however, are not nearly so impressive as the differences due to economic conditions of the various groups.

While the detached population must be housed, while lodging houses, dormitories, clubs, hospitals, and various institutions such as homes for dependents, defectives, and delinquents must be provided, we shall pass over these and devote our discussion to families.

The following table shows the number of families, dwellings, and excess

of families over dwellings, as well as the families to a dwelling, according to the Bureau of the Census:

TABLE II—NUMBER OF FAMILIES, DWELLINGS, EXCESS OF FAMILIES OVER DWELLINGS, AND FAMILIES TO A DWELLING, 1890-1920

Census Year	Families	Dwellings	Families over Dwellings	Families to a Dwelling
1920	24,351,676	20,697,204	3,654,472	1.18
1910	20,255,555	17,805,845	2,449,710	1.14
1900	16,187,715	14,430,145	1,757,570	1.12
1890	12,690,152	11,483,318	1,206,834	1.11

It will be seen, therefore, that the number of families to a dwelling has increased decade after decade. This reflects the increase in multiple-family dwellings. The extent of this tendency is shown more forcibly by the increase of 2,324,000 urban dwellings from 1910 to 1920, which housed 3,409,000 additional families—a ratio of 1.46 additional families for each additional dwelling.

Various attempts have been made to estimate the housing shortage in the United States during the last few years. Comparisons with pre-war standards are subject to greater error each year, due to the lack of local population statistics for the intercensal years, and of records of the amount of building. But for practical purposes, it may be useful to assume a present shortage of 500,000 homes, which is approximately equivalent to a normal year's construction. At least 500,000 new homes are required each year to take care of the increased number of families, as indicated by estimates based on census data, and by estimates made by the National Bureau of Economic Research, with due allowance for houses razed or converted to other purposes. The very great majority of American cities apparently require a net increase of from 2% to 6% of existing dwellings each year.

The construction of dwellings since 1922 has been about as active as could have been expected. The resources of the construction industries in the way of labor supply and production of certain materials have been taxed almost to the limit by the nation's construction program. Residential construction has constituted more than 40% of the total reported contracts awarded since 1922—an unusually high proportion. It has been estimated that in 1922 residential construction kept about even with normal requirements and perhaps contributed a little to cutting down the accumulated shortage. In 1923 and 1924 the accumulated shortage has been unquestionably reduced.

Types of Housing

Probably 95% of all rural dwellings are made of lumber—commonly known as frame houses. Judging from estimates obtained by the Division of Building and Housing of the Department of Commerce from nearly a thousand villages and cities having a population of more than 2,500, more than 75% of all urban dwellings in the United States were also constructed of lumber. Brick, stucco, tile, and stone houses show smaller percentages. While these percentages cover the houses already in existence, they in no way indicate the ratio of the different classes of houses now under construction. The figures are most striking in that they show the great difference between the houses in the United States and those in most European countries.

The single-family detached house is found almost universally in the country and villages. Double houses and row houses are common in many of our

cities. Classed with the single-family house are hundreds of thousands of so-called shacks not only in the country but in parts of nearly every city. A very common type of house is known as the "box" or square house. This is usually two stories in height and approximately square in its outline. It is the cheapest of all the single-family houses to build, per unit of space. Another common type is the "L" or "T" shaped house. This requires slightly more outside wall per unit of space but is found in all parts of the United States. The bungalow has enjoyed much popularity but the costs per unit of space are high because the foundation and roofing expenses are all chargeable to a single floor. During the last three years there has been a relative decline in the number of bungalows built in many sections, but the demand for them may return if building costs are reduced.

Most families prefer the independence and privacy afforded by a single-family house, but this must be balanced against the fact that it probably costs from 10% to 20% more per unit of space than the two-family house. If the owner of a two-family house occupies one floor and rents the other, he becomes not only the landlord but also the neighbor of the tenant. This relationship is often difficult to sustain. Although the entrances to the two houses may be separate, the rule is to build them with one entrance hall and this is only one step removed from having two families occupy the same quarters. On the other hand, the semidetached type of two-family house has a party wall between the two homes, and each home has its own side yard. The entrances are separate, and each family may own its half of the property.

Row houses are, of course, less desirable than detached or semidetached houses, but they cost less. Where lot areas must be small on account of the high cost of land, row houses, if all the rooms have windows, are preferable to detached houses with rooms depending for light and air on side yards only 3 or 5 feet wide. Row houses are not common except in a few of our cities.

Apartment houses are now found in all large cities and the increases indicate clearly a demand for a certain amount of this type of construction. The modern apartment house, as well as the old-style tenement, is most common in the down-town sections and wherever land values are comparatively high. While the sanitary conditions are very good in well-constructed apartment houses, many of them in the tenement districts of our larger cities are obsolete and do not have proper plumbing or sufficient light and air. Moreover, apartment houses do not afford as much privacy as single detached houses and are not so satisfactory for families with children, as the attitude of many landlords (and childless tenants) toward having children in apartment houses, however unsympathetic that attitude is, bears witness.

The character of the houses in the rural sections varies widely. In the best agricultural sections of the corn and wheat belt the houses have improved greatly during the last few decades. They are not only better built but the equipment is better and more modern. In the poorer agricultural sections, however, there are many shacks which do not adequately protect the occupants. Furthermore, they are poorly equipped. In villages under a population of 2,500 the differences in housing conditions are very noticeable. If the village is dependent upon agriculture, housing will vary with the

prosperous condition of the surrounding territory. If it is dependent upon manufacture, it will likewise depend upon the economic conditions in the industry.

Home Ownership

Home ownership in the United States is confined largely to that of single- and double-family houses. The percentage of families owning their homes in this country is greater than in the older European countries. In 1920, 45.6% of all homes were owned by the occupant and of this number 28.2% were owned free and 17.5% were owned encumbered. On some of these there is not only a first but a second mortgage or trust, and the equity of the owner is relatively small. While some such cases may lead to foreclosure, a debt on a home for which amortization, or paying off by instalments, is arranged, is a powerful incentive to saving which may lead the family to financial independence. Cooperative ownership of apartment houses is a comparatively new development, and its ultimate extent and significance cannot yet be foretold.

Cost of Present-Day Construction

The cost of finished houses is generally considered to be at least double that before the war. The cost of lots has commonly doubled or more than doubled during the past 10 years, while the costs of grading, water mains, sewers, gas and electrical conduits, street paving, and walks has advanced along with material and labor costs in dwelling construction.

Uncertainty in regard to building costs and the trend of real estate values has in many cases led contractors and operative builders to add extra charges to cover the discounts which they have commonly had to allow in disposing of second mortgages received in part payment. An additional factor contributing to higher costs is the desire for more expensive finish and built-in fixtures.

Despite the great building activity since 1922, a number of elements in the situation show that the road to further improvement is not fully cleared. As might have been expected, during the periods of shortage the needs of those best able to pay for new houses were met first, and what relief has come to the lower income groups has been through relief of pressure at the top, permitting families with lower incomes to move up into quarters vacated by those better off financially. High costs have led in some cases to sacrifice of quality of materials and workmanship in order to reduce expenses. A greatly increased number of multi-family houses has been erected recently. A disproportionate number of row houses has also been built, and, in fact, any type of house which could be produced cheaply has been constructed regardless of the fact that some have not met with reasonable housing standards. A very considerable number of the dwellings erected are built by operative builders to be sold at a price on completion. During the last two years, however, they have been able to count on a ready market, a condition that may not continue.

There has been very little building for renting. While some people believe that it is possible for everybody to own his home, there are many who through sickness, misfortune, or lack of earning capacity are not able to own a home; at least during part of their lives they will not be in a position to buy and will find it advisable or neces-

sary to rent. There are those who have no credit standing and there are those also who are migratory because their work takes them from one city to another. Since there is a need for houses to rent, it necessarily follows that some people must find the investment in housing desirable; they must be able to buy or build at a cost which will enable them to make a reasonable profit on the investment, and the rent must be within reach of the tenant. But uncertainty in regard to future rentals over a period of years has tended to discourage such investments.

While some buildings last for centuries, others are destroyed or torn down within a few years. A dwelling, with reasonable maintenance, should last for 50 years at least, and if our cities are well planned, there is no reason why more residence sections should not remain intact for many years. In such areas, temporary or shoddy construction is the most expensive. However, structures are frequently needed for temporary purposes, as in mining and lumber sections where other industries are not expected to come in when the mine has been exhausted or the timber has been removed.

The location of houses is another element in the present housing situation that deserves consideration. In most cities the location of houses has been helter-skelter and subject to little or no thoughtful study of future conditions. The type of house in demand at a given time has been built wherever there has been developed land to put it on. The development of subdivisions has often been decided by purely temporary considerations, such as availability of existing water mains, or the exigencies of the owner. It was perhaps inevitable that such should be the case. But as the situation becomes less frantic, there is less and less excuse for sowing the seeds of future trouble, as many cities are doing, through failure to adopt a constructive policy of city planning, zoning, and extension of public utilities.

Deficiencies in the Building Industries

The construction industry is not efficient when taken as a whole. There are too many different groups which contribute only a small part of the material or work going into a house, and too often each group feels no direct stimulus to seek means of reducing the cost of its part of the material or work, a cost which is very small in comparison with the total cost of the building. The market for houses would be greatly increased if waste could be eliminated all along the line. The large number of families having an income slightly below the average affords a good market for better houses, provided the costs can be reduced sufficiently to come within the reach of this group; but this potential market seems intangible to each small group that contributes a share to construction.

Under the present organization of labor more than a dozen skilled trades may be employed on the erection of even a small dwelling. Not many decades ago practically all work was done by four skilled trades. Most houses were built of wood and the carpenter was the principal skilled workman. He was not only skilled in framing but was probably also a skilled floor layer, roofer, and door-hanger. Today work is widely subdivided and the scheduling of work is most difficult for the small builder. There is not only the general contractor, but often also subcontractors employed by him to complete a group of small houses.

In short, the building industry is not

conducted on the factory system. There is little satisfactory routing or scheduling of materials. By way of comparison, in the automobile industry each of a large number of companies produces many thousands of cars, but in the building industry probably 75% of all the single-family houses are built by contractors erecting fewer than 10 houses annually. These homes are frequently scattered over a large area, making it difficult to schedule both materials and work. There are, of course, a few large operators who build several hundred houses each year and are able to schedule their work according to modern methods of production. If the conditions in the automobile industry were similar to those in the building industry, the manufacturer would build two automobiles on Broadway, two in Yonkers, four in Brooklyn, and two in the Bronx. There would be at least three different models, the spokes and metal would be cut on the job, three different types of engines would be used, and all purchases and deliveries would be in small quantities. Mass production would be impossible.

Another deficiency is found in the great variety of building material specifications. Is there any need for 30 or 40 different sizes of brick? Why have bathtubs made in 30 different sizes? Could we not get along without many hundred different sizes and styles of window sash? This lack of dimensional standardization of building materials is a considerable element in the high cost of such materials.

The irregularity of building activity has often been the subject of comment. For many years it was customary for building to proceed actively during six or eight months and practically come to a standstill during cold weather. The peak in building operations has required an excessive amount of equipment in the hands of the contractor to take care of the peak, and some of this equipment remained idle during the greater part of the year.

During the recent active building period a shortage of skilled labor developed, manifesting itself chiefly among the plasterers and brick masons. Although building trade workers are employed by the day, they must live throughout the year; hence the wage scale is not as important to them as the length of the building season. In order to induce young men to enter the skilled trades as apprentices it is necessary to show that the building season can be lengthened, for few men care to enter a trade which normally provides fewer than 200 working days per annum. Some of the contractors claim that the unions have arbitrarily limited the number of apprentices in order to maintain a scarcity of skilled labor. The labor leaders, on the other hand, say that their organizations have not restricted the number of workmen in the trades but that contractors usually decline to accept more than a very few apprentices and some refuse to employ any apprentices whatsoever.

Consider also the financing of contractors! As a rule contractors and operative builders are financed largely by banks. As long as the market for houses is good, the builder, with a relatively small amount of cash, can obtain sufficient funds to finish each job. During the past few years the contractor has frequently discounted the second-mortgage note in order, in this way, to secure added cash which could be used on the next job. Thus, although money was available for contractors, the commissions and bonuses demanded were especially high during the recent shortage of money.

Private Agencies for Betterment

Fortunately there are many constructive forces at work, which will in time go far toward solving many of the present difficulties. Some of these corrective forces may be found within the building industries themselves.

The desire to maintain construction activity at a high level will undoubtedly encourage contractors generally to develop more efficient methods and use of material, and in this the cooperation of manufacturers of building materials is expected.

The movement for dimensional standardization of building materials, which is so strong today, should help reduce the cost of building materials. A drastic reduction of sizes of most of the items going into a house will not necessarily limit variety in design but will result in savings not only to the producer and distributer, but to the owner. It will also reduce the cost of maintenance and repairs, for standard stock can easily be obtained. The Division of Simplified Practice in the Department of Commerce, which has been encouraging such simplifications, has been unusually successful in the field of building materials.

There is also the possibility that large-scale production of houses may develop so as to result in considerable economies.

To relieve the labor shortage, apprenticeship schools have been established in a large number of cities to train young men in the trades involved. Nevertheless, it is recognized that irregularity of employment deters many young men from entering the industry.

In this connection, investigations by the Department of Commerce for a Committee of the President's Conference on Unemployment have demonstrated that the customary dullness in building activity during several months of the year is largely unnecessary. Certainly contractors and building-material producers and dealers can operate more economically if work is distributed more evenly throughout the year. This fact is receiving more and more recognition.

Various efforts are being made to lengthen the building season. The central part of the program is to have more buildings planned with reference to probable labor supply and to have repair work undertaken during the inactive season of the trade involved. The cooperation of government officials in charge of public works and of building owners, and even of householders who may have repair or maintenance work on hand, is being sought.

The building and loan associations of the country are fortunately doing much to supply the machinery needed within each community for borrowing money to be lent to prospective home owners. Although the remarkable increase in the assets of these associations during the past five years is most encouraging, it has been accomplished only through the aid of public-spirited citizens. Many communities are not so well provided as they should be with building and loan associations, savings banks, and other institutions that lend to home-seekers.

The American Institute of Architects sponsors several bureaus which design small houses. Very few of the single-family houses have been designed by architects, and the results are evident everywhere. These bureaus, however, sell plans, working drawings, and so forth, for a nominal sum. The cost of these plans to the home-builder is small, due to the fact that the sale of each plan is large; but the savings, due to advantageous planning, are consider-

able. The extras called for in one of these plans should be practically nil, unless the builder or prospective owner insists on making changes in the original drawings. The savings effected by having a complete bill of materials in the beginning much more than pays for the cost of the plans.

How far shall industry provide employees with housing or aid them in obtaining satisfactory living quarters? This question has not been answered fully yet. Some industries assist their regular or steady employees only, or perhaps confine their aid to officers and key men. Wherever the location of the work is temporary, as is often the case in lumbering and mining, industrial housing is necessary. Although many employers would like to build for their employees, the great majority cannot well obtain the necessary credit. As yet, industrial housing is not a very important factor in most of our communities. Neither are housing corporations, of the type formed immediately following the war, which were apt to build houses without specific occupants in mind. In these cases a frequent result was that the costs were too high to permit sale or rental, at a profit, to the class of workers for which they were intended. Very few of these corporations are now active.

The National Housing Association, with headquarters in New York, aids in the drafting of housing laws and helps various communities in efforts to improve housing conditions. It publishes a quarterly magazine, *Housing Betterment,* which furnishes information as to what is taking place not only in the United States but abroad. The American Civic Association also interests itself in housing and especially in certain phases which add to the security of the home and the attractiveness of the surroundings. It distributes information on city planning, zoning, parks and playgrounds. The Civic Development Department of the Chamber of Commerce of the United States serves hundreds of local chambers in respect to housing conditions, coordinating their work. Its interests include city planning, zoning, and housing. Better Homes in America encourages "better homes demonstrations" which are held one week each year in cities throughout the United States. Its central organization serves as a clearing-house of information and contact for the local committees which equip and furnish the demonstration house, as well as build it in some cases, with the idea of showing how attractive a home can be had at a minimum of expense and with a lessened amount of labor required for housekeeping.

Public Agencies for Betterment

Governmental agencies are doing much to aid and encourage better housing. The Federal Government is engaged in a number of activities which indirectly improve the situation. In the Department of Commerce, the Bureau of Standards carries on research in the properties and uses of building materials; and the Division of Building and Housing, established in 1921 under Secretary Hoover, has obtained the cooperation of leading professional societies and organizations connected with the industry. This division has prepared recommended building and plumbing code requirements for small houses; has issued a standard state zoning enabling act, which has already been adopted wholly or in large part by 13 states; has prepared a booklet entitled "How to Own Your Home," which has had a circulation of several hundred thou-

sand copies; has made a study of seasonal operation in the construction industries; and also has served as an agency in the Federal Government to disseminate information concerning the relation of housing to general economic conditions. Also, as was stated previously, the Division of Simplified Practice is working with the industry to reduce the number of sizes and dimensional varieties of a number of important building materials.

Along different lines, the Federal Government has bettered conditions by enacting the Farm Loan Act, which allows owners of farms to borrow at low rates of interest on farm property through an organization permitted to obtain funds by selling tax-exempt securities, and granted other advantages. Under the Income Tax Law, income up to $300 received from deposits in building and loan associations is tax exempt. This provision was made to encourage deposits in these institutions, which make practically all of their loans on the security of real estate and a very considerable percentage of them on dwellings.

Some state governments, during the war or immediately after it, enacted rent laws usually effective in a few municipalities only, to protect tenants by limiting the rights of landlords. In some respects the ownership of real estate for renting was thereby made less attractive than other investments. Very few states have entered directly into the field of home financing, but their laws relating to savings banks and building and loan associations are very important in protecting home-seekers in their dealings with such institutions, and in encouraging local capital to seek investment through such channels. In some states the tax laws penalize mortgage investments by individuals as compared with other forms of investment. A number of states have adopted housing laws aiming to establish a minimum standard below which no house which is built or occupied may fall. Housing laws usually cover light and air as well as some of the phases of sanitation. Some states have state-wide plumbing regulations, and these have been recommended by the Department of Commerce Sub-Committee on Plumbing Codes, which formulated a set of general requirements for the purpose. Statewide building codes are of more limited application. The state governments should also have enabling acts permitting cities to zone and granting authority for city planning. State legislation permitting regional planning promises good results. In a number of cases creation of sanitary districts covering a group of villages has done much to promote better housing.

Municipal, or local, governments have many responsibilities in connection with the housing problem. Several hundred communities have building codes, adopted and enforced by city authorities, to protect the public from losses due to the acts of unwise or unscrupulous builders; and, by requiring good materials and good methods of construction, these codes help to prevent the collapse of buildings, and to lessen the chance of fire and retard its progress when it occurs, thereby helping to preserve the lives and property of the occupants. In some cities a single building code covers practically all of the building regulations, while in others a separate plumbing code is in force. Poorly drawn codes often add unnecessarily to the expense of constructing dwellings. The requirements of different cities vary to a marked degree and cause a great deal of confusion, much of which could be eliminated through

more general recognition of the provisions recommended by the Department of Commerce, which have had a very wide endorsement from building officials. Many cities also have housing laws, and in general the enforcement of state housing laws is largely left to the city administration. A city government can, if it wishes, do much to eliminate slums and ramshackle dwellings, although, if the law be too stringent, overcrowding may result, or slums may grow up outside the city limits.

City and Regional Planning, Zoning, and Control of Subdivisions

One of the most important functions of the local government is its control over the use of land. Every dwelling must be located on some tract of land. It may vary in size, in shape, and in distance from transportation and from the central part of the city. Thousands of houses are misplaced, due to the failure to follow a city plan or to the entire absence of any recognized plan. Before the land can be properly subdivided into blocks and building lots, the main thoroughfares and transportation routes should be clearly decided upon. Careful study of the uses of the land should be made in order to determine what sections and what plots are best suited for dwellings, for business, and for industry. If this is carefully done and proper zoning ordinances are enacted, it is safe to build a dwelling in such an area. If such a study is not made and houses are located at the will of the operator or subdivider, many houses will have to be torn down later to make place for business houses, streets, parks or schools. This destruction of houses entails an enormous waste which is unnecessary if proper city planning and zoning prevail.

The subdivider performs an important function. It is most difficult, however, for him to plan an addition as long as the city proper has no plan. In such cases he is obliged to forecast as best he can the future development of the city. As long as cities fail to adopt a regional plan of growth, the citizens have little reason for criticizing the work of the subdivider, provided the lots are of proper size and the "roots" of the house, such as sewer, water and gas mains, and electric lighting wires, are adequate and in harmony with the system needed by the city.

Some cities exercise little control over new subdivisions; the result is that hundreds of more or less independent units are laid out without reference to the city proper or to other subdivisions. Later the taxpayers pay for the shortsightedness of the promoters, because of the necessity of widening streets, cutting through dead ends, paving streets for heavy traffic, and changing the sewerage and water mains. Although it is extravagant to put through miles of improved streets, sewers and water facilities years before they will be utilized, construction of houses is retarded in many cities by the existence of too little land on which such improvements may be made. It is important that those who wish to build homes have some choice as to locations with the necessary facilities and public utilities; otherwise there is not a free market for developed land, and prices may be unnecessarily high.

Surrounding all of our large cities are scattered villages outside the city limits. They often develop without reference to the larger city and after they have been annexed changes must frequently be made in street plans and in other features. These changes will cost the taxpayers millions in the fu-

ture, and will add materially to the cost of housing and to living costs in the community. An examination of the operating expenses of our large cities is conclusive proof of the fact that the absence of a plan costs the taxpayers of the country millions of dollars for widening of streets alone.

Regional planning is essential if this waste is to be avoided. As was stated before, the subdividers cannot be blamed entirely for this condition, for often the larger city has no plan.

Housing as a Community Problem

Every large city has a housing problem. There are always those who are inadequately housed. It is not always of their own volition that they live in unsanitary and poorly constructed houses. It is not always a problem due to difference in race or foreign birth. The desire to live in better homes is strong in most people, but their economic conditions are not always such as will permit them to live in suitable houses. While we need much educational work to teach people what constitutes good housing, the financial inability of many to secure a proper dwelling is a far greater obstacle than ignorance as to what is a good house. Whether it be due to sickness, misfortune, accident, or inefficiency, the fact remains that there are those who practically become a public charge or live in quarters absolutely unfit to produce desirable American citizens.

It is the duty of local communities to bring about conditions which will permit children to grow up to become good, plain, honest folks. If poor housing conditions, such as are found in the slums, are to be eliminated, the civic pride of every city must be awakened before voluntary community action will be taken. Even if we grant the contention of some that "slums will always be with us," we all wish to keep such sections down to the minimum. If the communities will not act, government housing may be the outcome.

Local community action has taken various forms. In some cities the chief effort has been directed toward the reduction of the cost of houses. This cannot be done without collective action. No individual or group can bring about a marked reduction in the cost of small houses. The architects cannot do it. The engineers cannot do it, nor can the contractors. It requires the joint effort of all groups, not only those named, but the financiers, wage workers, building-material producers and dealers, as well as the public.

A Housing Survey

Before community action can be intelligently directed, a housing survey should be conducted in the city. It should include a study of the types of houses and their condition, as well as of the population living in unsatisfactory houses. The survey should not only show the extent of congestion but it should also list the vacant houses, at least the habitable vacant houses. A survey of this kind should be conducted at least once each year and preferably once every six months. From the facts obtained it should be possible to determine the number and kind of dwellings needed to accommodate the poorly housed population. The income of the families must also be considered in determining the buildings to be erected.

One of the first steps that should be taken in any community is to make a careful study to determine what is the best use that can be made of land; this

should be followed by a comprehensive city plan (in accordance with which subdivisions should be controlled) and a zoning ordinance. As Herbert Hoover has said, "The enormous losses in human happiness and in money which have resulted from lack of city plans which take into account the conditions of modern life, need little proof. The lack of adequate open spaces, of playgrounds and parks, the congestion of streets, the misery of tenement life and its repercussions upon each new generation, are an untold charge against our American life. Our cities do not produce their full contribution to the sinews of American life and national character. The moral and social issues can only be solved by a new conception of city building."

FORESTRY AND LAND DEVELOPMENT IN THE LAKE STATES

By RAPHAEL ZON

RECENTLY there has been a marked change in the position taken by agriculturists and lumbermen on the place of forests in land development. For a long time the opinion prevailed that forests are inimical to agricultural development, and that they must give way to provide room for farms. This opinion is not now so prevalent as it was in fairly recent times. The experience with settlement on cut-over land has driven home a few painful lessons. The agricultural crisis through which the country is passing is also contributing to clearer thinking and a more sober attitude toward land development. The cold economic facts tell the story very forcibly.

There are 331,000,000 acres of cut-over forest land in excess of the needs of agriculture. The removal of the forest proceeds at an increasing rate and the area of the cut-over land is growing, while new agricultural development is falling constantly behind. During the 10-year period between 1900 and 1910, an average of 6,400,000 acres was put under cultivation annually, as against 9,400,000 acres cut over. Between 1910 and 1920 only 2,500,000 acres were improved as against 10,000,000 acres cut over. Today it is estimated that only 1,000,000 acres are being improved annually, and even this is offset to a large extent by the abandonment of farm land in the East and South, while clearing the land of forest is continuing at the rate of approximately 10,000,000 acres a year. Much of the new development between 1900 and 1920 was confined to the treeless and semi-arid lands of the West. Michigan, which has 15,500,000 acres of cut-over lands, showed the insignificant increase in improved farm land of only 93,000 acres from 1900 to 1920. The rate of land improvement fell off 62% in Wisconsin between 1900 and 1920. Wisconsin now has more cut-over and idle land than ever before, some 13,000,000 acres, which is more than all the improved farm land in the state. In Minnesota, with some 18,000,000 acres of cut-over land, there was an increase of only 1,000,000 acres in improved farm land during the last decade. In Michigan, at the average rate of settlement for the last 20 years, 380 years would be required to settle the present area of cut-over land and the remaining timberland that will soon be cut over. In the Upper Peninsula 800 years would be required; in the northern part of the Lower Peninsula, 200 years. In Minnesota, at the rate of clearing and settlement of the past 40 years, it would take nearly a century to absorb into farms even the best part of the land now idle.

The 1920 Census shows that the area of improved farm land in the eastern United States, where the bulk of the cut-over land is found, did not increase in the last decade. In some states, not only the area of improved land but even the total area of farm land decreased.

In the face of these facts, can there be any further doubt that agriculture alone cannot solve the problem of our vast domain of cut-over lands? In some places the clearing of the forests

not only did not help to increase the improved farm land but had the opposite effect. It caused an actual shrinkage of the area under agriculture, particularly on the poorer marginal lands. Whereas previously the small farmer could maintain himself in a lumber region partly by selling the products of his farm to a nearby logging camp and partly by finding employment for himself and his team in winter logging operations, he found himself, with the logging industry cut off, without a nearby market, without nearby employment, on a piece of land the products of which could not compete with the agricultural products of better lands situated nearer the big centers of consumption. So the farmer departed in the wake of the logging industry. Abandoned farms, so characteristic of our cut-over regions, are the aftermath of the clearing of the forests and the disappearance of the logging industry from them.

There is a gradually growing realization throughout the country that the forest is not a mine that is merely to be exploited and abandoned, but that it is itself a crop, a product of the soil, that it belongs to agriculture, that forest land can be used over and over again for growing crops just like wheat or corn land or any other agricultural land. It has become clearer and clearer that agriculture and forestry are no longer inimical to each other but are really parts of the same industry—the growing of crops. Any agricultural development in a timbered region today that ignores the timber as a part of the land utilization, unless the land is exceptionally fertile and favorably located near big centers of consumption, is not sound development. On the other hand, forestry can gain a great deal from agricultural development in the region.

The Lake states in particular are favorably located as a source of timber production. The region is close to big consuming centers such as Chicago, Detroit, Kansas City, and the large prairie region to the south and west. It is the cheap timber of the Lake states that in the past contributed so much to the wonderful and rapid development of our prairie region. It will do so again in the future. The Lake states region with its wonderful water resources, capable of cheap water-power development and cheap water transportation, is ideally located for many wood-using industries—the pulp and paper industry, the wood distillation industry, box manufacture, and a multitude of other industries based on wood as the raw material.

The forest, as a timber crop, must be the basis of the economic upbuilding of the northern part of the Lake states. Only with the aid of the forests will agriculture be able to take firm root in that region. How can this be done? What are the concrete and specific plans which must be put into operation to bring this about? There are two distinct phases, as I see it, to the forest problem in the northern part of the Lake states region as it bears upon land settlement and development. The first relates to the forest land still covered with merchantable timber which is to be cut in the near future. The second relates to the cut-over lands of the region.

The Problem as Related to Uncut Forests

There still remain in the Lake states region considerable areas of old timber that will be cut during the next decade or two. This is particularly true of the Upper Peninsula of Michigan and some parts of northern Minnesota, and to a less extent of northern Wisconsin.

What policy should be followed with regard to the 10,000,000 acres of forest land of old timber which is still to be cut over during the next several decades? Are we to treat this forest in the same old way—cut it clean, burn, and then either let it revert to the state for non-payment of taxes or attempt to develop it for land settlement and find settlers for it? Or shall we develop it partly for agricultural use but chiefly for forest use?

There is a vast difference between the old settlement, which on the whole was fairly successful, and the recent settlement that is a slow process and only partly successful. The early settler, when he came to this part of the country before logging operations began, cleared his farm from the timberland. While clearing a few acres for his homestead, the forest furnished him logs for his cabin; he trapped and hunted animals in the woods and fished in the streams, which provided him with fur and meat. Occasionally he would cut a few logs and bring them to the new settlement. The forest was his first source of revenue and helped him to clear the land and establish himself as a farmer.

It is different now. When the settler comes to his land, he finds nothing but cut-over, bare land with charred stumps. If he is to engage in clearing this land, he must have capital at least for a year or two. This, as a rule, he does not have. The result is that he must work outside, in which case his farm is left uncleared. Or he makes a strenuous effort by working 18 hours a day, working his wife and children, to clear the land, and too often he loses his savings and returns to the city, a more disgruntled man than before. Sometimes it takes several successive settlers on the same piece of land to clear off enough of it to enable the last one to make a living from it. The fact is that while the settler is attempting to clear his land he has no revenue. Is there not a lesson in this contrast for a sound land development policy?

One possible way to handle such timberlands for the purpose of securing both agricultural and forest development is here suggested. This applies particularly to the Upper Peninsula of Michigan and northern Wisconsin where the forests consist largely of birch, beech, maple, and hemlock, growing on fairly good agricultural land. The plan briefly is this: Instead of cutting clean a tract of timber and then attempting to secure settlers for this cut-over land, leave with each (say, 100-acre) farm unit, from 20 to 50 acres of merchantable timber on the ground. It is not necessary to leave exceptionally large-sized timber, and it may even be advisable, for the sake of reducing the cost of the land to the settler, to cull this forest of some of its largest timber. The advantage of this plan would be that the settler in taking up such a farm would have at once a crop which he could begin to utilize immediately and which would provide a living for him, and would act as his banker to finance him while he is clearing the rest of his farm for agricultural use.

Such a plan would not be without advantage to the mill operator. The development of highways and the advent of the auto truck as a means of transportation, particularly as auxiliaries to railroad transportation, are revolutionizing in some localities our logging methods. A mill, particularly a pulp and paper plant, using auto trucks on the good highways, which are becoming so prevalent even in the most remote parts of our forest region, could tap the country for raw materials within a radius of

30 to 50 miles from the mill itself or from any railroad point tributary to the mill. In this way the mill man will insure for himself a permanent supply of raw materials without tying up capital in stumpage which at present has to be carried for from 20 to 30 years. He will be relieved from paying taxes on this stumpage, from the cost of protecting it from fire, and from standing the risk of insect infestation by the budworm or of other damage to the timber. He would be relieved of a considerable investment in logging equipment because (and this is a very essential point) the settler would be the lumberjack. For the same reason he would be relieved to a large extent of the labor problem. The farmer living on his farm would provide the most intensive fire protection for his woodlot that any organization, state or federal, has yet devised. But, what is more essential, the settler could handle his woodlot as a permanent crop, which the lumberman with large tracts still fails to do, and therefore could provide a permanent source of material. The timber operator would be further benefited through such a policy by earnest local cooperation in keeping out fires and lowering taxes. On the other hand, the settler would be assured of permanent profitable work at home during the winter for himself and his team. He would have a revenue from the very start which would enable him to put all his time on his farming in summer, as the money earned in winter would relieve him of the necessity of doing road work or other outside work during the summer.

There are, of course, some weaknesses in this plan. Still, they can probably be gradually eliminated. Of course, the first objection will be that if some merchantable timber is left on the land, the land may be too costly for the farmer. The farmer may realize at once on his woodlot and may cut it clean, just as the lumberman would do. And then a large sawmill or pulp mill cannot depend entirely on raw material obtained in such a manner. However, the mortgage on the farm and the timberland will be held by the land colonization company. The mortgage may specify that no clean cutting or destruction of the woodlot may be done without forfeiting the property. The Federal Land Bank of St. Paul now has under consideration a plan for advancing loans against farm woodlots in the states of Michigan, Wisconsin, and Minnesota, just as the Springfield, Massachusetts, Federal Land Bank is doing in the East. Among the conditions of these loans are the maintenance of the woodlot in a thrifty, growing condition, its protection against fire, and proper handling. This plan probably cannot solve the entire problem of raw materials for any large-sized pulp mill or sawmill. The pulp or sawmill man will still have to carry a large area in forest to keep his mill going, but such a system can contribute a large share of raw material, and thereby reduce the area necessary for the mill man himself to carry.

The time has passed to a large extent when money can be made simply by buying cheap stumpage and holding it for increased prices. Stumpage will undoubtedly continue to increase in price but not at the same rate as in the past and not rapidly enough to offset the increased cost of taxation, fire protection, and other care of the property. If, therefore, the sawmill man could find a way by which he could secure his raw materials without taking all the risk of carrying the raw materials for several decades, it would greatly lighten his

burden. This explains why the lumbermen are more and more welcoming the establishment of national forests and the purchase of timber from the government. First, they are assured of a permanent supply, since the government is cutting its timber in such a way as to secure its continuous renewal. Second, the lumberman does not need to tie up a great deal of money in raw materials and does not need to assume the risk of fire damage or bear the cost of taxation.

The Cut-Over Land Problem

The problem of the cut-over land is by far the bigger of the two because it involves much larger areas, probably not less than 47,000,000 acres in the three states. The effective utilization of this land will require the best thought of our agricultural colleges and state and federal agencies. It is fully realized now that only a small part of this land can be absorbed into agriculture and that for the bulk of it the growing of timber crops will be the only effective use.

Before a definite and permanent policy is formulated for this vast area of cut-over lands, there should be, first of all, an inventory of them; that is only common business sense. When you have a big property for which you want to work out a plan of handling, you must know first of all what you have. What land, for example, is to be set aside for agriculture? What land for forest purposes? What other land entirely for recreational purposes? A plan of this sort need not involve a detailed soil survey, but it does require a common sense sizing-up of the usefulness of the different kinds of land for different purposes. I have in mind a survey similar to the Michigan Land Economic Survey which is now being made at the cost of some 4 to 6 cents an acre for field work and which has yielded very satisfactory results. Such an inventory will furnish a basis not only for a forest policy for the state but also for an agricultural policy, a fish and game policy, and any other conservation policy, whether it relates to water-power development, to the development of swamps for peat production, or to anything else.

Before such an inventory is completed or even contemplated, however, a few evident things must be done now.

1. Fire protection for all cut-over and other forest lands should be made more effective. This fire protection must extend to the forest lands of the entire state. Michigan and Minnesota have, at least in principle, state-wide fire protection now. In Wisconsin, however, less than 10% of the forest land that needs protection is now actually under some form of fire protection. Over the rest of the state fires are burning freely without anybody's being concerned or responsible for putting them out.

Too large an area of forest land is burned over every year in Michigan and Minnesota, the states for which statistics are available, and also very likely in Wisconsin, if such statistics were available there. It is possible under efficient fire protection to reduce the percentage of forest burned over annually to about .2% of the total forest under fire protection. This is being accomplished not only in European countries but in some of our own states, for example, Vermont and Maine. When the percentage of forest that is burned over annually is reduced to from .1% to .2% of the total forest area, the forest will become an insurable risk acceptable to insurance companies. On the farms the forest would then form an asset against which the Federal Farm

Loan banks would be justified in advancing loans, as is done already in New England.

Fire protection could be made more effective, in several ways—by the provision of sufficient state funds to conduct the work, by further cooperation between the state and Federal governments (the Federal Government providing assistance for fire protection not only of forested watersheds but of all forests), by cooperation between the state and private timber owners, and, also, by cooperation between the three Lake states in fire protection. Only too often a fire starts in one state, where the fire-fighting organization is not very strong, spreads to another state, and causes there a great deal of damage. Moreover, many timber owners have interests in two or more states. Hence the three Lake states should work out more or less uniform methods of fire protection and cooperate in carrying them out.

Fire-protection work may also be strengthened by studies of the occurrence of the dangerous fire periods, the fire hazards in the different kinds of forests, the methods of actually fighting fires, and the collection and analysis of fire statistics.

2. Within each of the three states there are still large areas of state-owned land which should be used for growing timber. Some of it is in good forests, but most of it is cut-over and bare land which, as a rule, reverted to the state for non-payment of taxes or from which the state itself sold the timber without provision for its renewal. It should be the duty of each state to put that part of its public domain which is forest land into growing timber to meet the present and future needs of its people.

The state of Minnesota has some 1,700,000 acres of land, of which some 600,000 or 700,000 acres still contain old timber which is now being sold by the state. Of this 700,000 acres, 380,000 are organized as state forests and are under forest management, which as yet is inadequate for effective results. In Michigan, with an area of almost 700,000 acres of state lands, only 105,000 acres are organized as state forests and receive technical consideration. The situation in Wisconsin is even worse. Out of a total area of 338,000 acres of state-owned land, only 159,000 acres form so-called Forest Reserves, which are only partially under forest management.

An especial obligation rests upon the state to devote its public forested-domain to growing timber of large sizes. The advent of the pulp and paper industry has greatly changed timber values. Whereas previously in talking about growing timber we talked in terms of large-sized trees, capable of producing sawlogs and lumber, now the pulp and paper industry utilizes wood down to 3 inches at the top. Stands, which are 6 and 7 inches in diameter at the stump at an age of 35 to 40 years, as is the case with jack pine, poplar, and second-growth hardwoods, are now merchantable. The growth of such forests begins to look fairly attractive to private timber owners, particularly the owners of pulp and paper mills. The private owner, however, cannot yet see his way to grow the large-sized trees which produce lumber. It requires too long a time. For this reason it should be the function of the state and Federal governments to grow in the public forests timber of the larger sizes. The state and Federal governments view an indefinitely extended future. They may live a thousand years after we are gone. They pay no taxes, and they are not seeking immediate profits. They can,

therefore, grow the sizes of timber that the private owner cannot profitably grow and it should be their duty to do so. The small merchantable timber will take care of itself. The end of the old large-sized timber is fairly within sight, and if we are to have this kind of timber, the state and Federal governments must begin to grow it right now.

3. The area of national forest holdings in each of the three states should also be increased by deeds from states and partly by gift from private individuals. In Michigan, the Michigan National Forest, near East Tawas, could be increased considerably by such additions. A large area of cut-over land can be included to great advantage within the boundary of the present Superior National Forest in Minnesota. There should be a national forest also in the state of Wisconsin. The national forests form not only the nuclei where large sawtimber can be grown, but they will serve as demonstration areas, as examples of good forestry for all private owners. They will help to solve the problem of idle cut-over land which the state alone cannot hope to solve. Under the Clarke-McNary Forestry Act, which passed last year, the Department of Agriculture is now authorized either to buy land or receive donations of land for timber production in the Lake states.

4. Farm woodlots present another opportunity for improving the forest situation. Most of the farms in the three states have farm woodlots. Some of them contain good merchantable timber, others have second-growth or brush land. The total forest area on farms in the three states of Michigan, Minnesota, and Wisconsin is 13,100,000 acres. The farmer's woodlot forms a very important part of his farm management. Professor Peck, of the University of Minnesota, found that in some of the northern counties of the state the farmer derives as much as 23% of all his income from his woodlot, even in the present condition of the woodlot. In St. Louis County, Minnesota, the income from the woodlot is even as high as 50% of the income of the settler.

As a part of the cooperation between the state and Federal governments in providing extension specialists in different lines of agriculture, there should be in each state extension specialists in forestry who could, in cooperation with county agents, teach the farmer the best methods of growing and marketing his forest products, of planting the waste land on his farm, and of selecting the kinds of trees to plant. In the southern and western parts of Minnesota, which border on the prairie region, the windbreak is a vital matter to the farmer. The state of Minnesota, as a part of its Cloquet Experiment Station work, is carrying a specialist in windbreaks. He makes plans for the planting of windbreaks, selects the kinds of trees which in his opinion will succeed best, supplies the planting material at cost and later supervises its handling and development. Wisconsin and Michigan should also provide specialists in forestry who could advise the farmer just as he is being advised now about other phases of agriculture.

5. A law should be enacted in Minnesota, similar to existing laws in Michigan and Wisconsin, whereby the state should furnish farmers and other citizens with tree-planting material at cost for planting of windbreaks or planting on their waste lands. In Minnesota there is a vast area of waste land which could be planted in this way.

6. The problem of the cut-over lands would be more easily solved by

the efforts of private individuals if our present system of forest taxation were modified so that the land and the forest crop would be taxed separately. Forest land, like any other class of land, should be taxed annually but the forest should be taxed only at the time of cutting. At present the forest is being taxed every year, and this puts too heavy a burden upon the timber owner who wishes to grow timber, and discourages the holding of his timber lands. In the long run such a change in forest taxation will not mean a reduction of the amount of revenue obtained from the forests, for, after the adjustment has been made, there will actually be an increase in taxable property. At present in these three states there is too much land that yields no tax revenue.

7. Another means of improving the situation is research in the technique of forest culture. This is a field in which the Lake States Forest Experiment Station is very much interested. If we are to grow forests as a crop, we must know how to do it. This requires studies and research. More than 40% of the total land area of the three states is still in forests of some kind, a much larger area than that in improved farms. For the entire United States some $8,500,000 is being spent now for agricultural research, and I believe that this sum should be increased. At the same time I feel that a study of a crop like the forest, which occupies an area as large as the entire area devoted to cereal crops in this country, ought to receive more than the $125,000 which is now being spent for forest investigations, which include the acquisition of knowledge of this important crop. Only compare the sum of $125,000 now spent for research with the $2,250,000,000 of forest products cut yearly from our forest lands, or the $250,000,000 which is paid for lumber transportation alone! This latter charge is the price that is paid for bringing the lumber which is needed by our industries and agriculture from distant points, such as the Pacific Coast and the South, while we neglect to utilize our idle lands at home.

The problem of the cut-over lands is very large. Yet the united efforts of the states, the Federal Government, and private timber owners, and an alert and intelligent public opinion, can soon put millions of our idle acres at work, place agricultural development in the new parts of the region on a stable foundation, and thus contribute to the economic growth of the entire region.

THE TAXATION OF PUBLIC SERVICE INDUSTRIES—A PRELIMINARY REPORT

By HERBERT D. SIMPSON

AMONG the various types of increase in industrial costs in recent years—labor cost, fuel and material costs, merchandising and distributing costs, and others, none is more striking or persistent than the increase in the "cost of government" to industry. Government is, of course, indispensable to industrial efficiency, as much so as management, equipment, or anything else. Moreover, an increase in price does not necessarily mean an actual increase in cost, as has often been pointed out in discussions of the cost of living in general, because, while the units of comparison remain the same, the quality may have changed materially. A quart of milk left on the doorstep in a sealed bottle, under the protection of state and national pure food laws, dairy and food inspection, butter-fat requirements, refrigeration and pasteurization, is, after all, a very different thing from the quart of milk poured out of a five-gallon can in 1890. So we may hope that the quality as well as the quantity of government has improved somewhat, in partial compensation for its increased cost per unit.

Be that as it may, the steady increase of tax burdens in recent years has been a source of apprehension and more or less of agitation in probably every field of industry—"a threat of impending disaster," President Head, of the American Bankers' Association, declared a few weeks ago.

In the public service field, two developments in public policy, entirely aside from recent increases in taxation, have created the necessity not so much for agitation, but for careful scientific study and statistical analysis to a degree that has not existed hitherto.

The first is the gradual abandonment, both in theory and in legislation, of the idea that some *special* tax policy must be applied to public service industries, as distinguished from the general tax policy under which other industries are taxed. Students of tax history will recall the long swing of the pendulum from outright government subsidy and tax-exemption in the early period of public utility development, through the "uniformity" movement of the 50's, down to the later period of resort to special taxes of every kind in an effort to recover some of the extortionate profits of unregulated monopoly. In the earlier period, when growing communities needed transportation more than taxes, money, or anything else, there were no statistics. In the later period, when the United States Supreme Court ruled in a Kentucky case that the reports of street railway, gas, and water companies to the county auditor were "complete and perfect assessments, not subject to revision by any board or court and conclusive upon the taxing officers," [1] when a Maine tax commission reported a prosperous street railway in that state paying taxes of $9.48 [2] and when the Pullman Company was paying

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[1] *Cin. N. O. & Texas Pac. R. R. Co., etc.* v. *Commonwealth of Kentucky*, 115 U. S. 321 (1885).

[2] *Report of Maine Special Tax Commission*, 1890, p. 49.

taxes of $6.45 in Michigan [3]—statistics would have been superfluous.

The remarkable development of public service industries in the United States since that time, to a point where they now represent a total value of close to 40 billions of dollars, or one-eighth of the estimated total wealth of the country, has removed the occasion for exemption or other governmental favors on the one hand, and on the other the development of public regulation has removed the necessity for resorting to taxation for the recovery of excessive profits that no longer exist. The Committee of the National Tax Association on the Taxation of Public Utilities merely recognized the facts of the situation when it reported in 1913: "Your committee is unable to find any good reason for giving such companies a separate classification." [4] Likewise, Professor Bullock probably epitomized prevalent opinion on the subject in his statement before the Federal Electric Railway Commission in 1919: "Under normal conditions public service corporations should be taxed neither more nor less than other classes of public concerns."

Occasionally, it is true, a political speaker will still advocate some special taxation as a weapon of conflict against public utility or other corporations; and occasionally a public utility representative, arguing from the "Public Agency" theory, will attempt to resurrect a plea for partial exemption of public utility industries from taxation. But a survey of the tax legislation of the past four years, and of much of the discussion accompanying it, appears to afford ample proof that Professor Bullock's common-sense statement above represents the view now generally held—one may say almost uniformly held—by students of taxation, by legislative committees and tax officials, and by the business community in general. At the present time there is probably nothing in the whole field of taxation upon which

[3] *Second Report, Board of State Tax Commissioners, Michigan,* pp. 77-8, referring to taxes of 1901.

[4] National Tax Association, *Papers and Proceedings,* 1913, p. 380.

TABLE I. TAXATION OF STREET AND ELECTRIC RAILWAYS
All Operating Electric and Street Railways in the United States
Condensed Income Account

Item	1902*	1907*	1912*	1917*	1922†
Gross Receipts‡	$250,504,627	$429,744,254	$585,930,517	$730,108,040	$1,049,048,321
Operating Revenue	247,553,999	418,187,858	567,511,704	709,825,092	1,016,719,092
Operating Expenses	142,312,597	251,309,252	332,896,356	452,594,654	727,795,168
Net Operating Revenue	105,241,402	166,878,606	234,615,348	257,230,438	288,923,924
Non-Operating Income	2,950,628	11,556,396	18,418,813	20,282,948	32,329,229
Gross Income	108,192,030	178,435,002	253,034,161	277,513,386	321,253,153
Interest, Rentals, and Miscellaneous Deductions	64,516,154	118,339,114	149,866,307	175,305,761	199,453,934
Net Income before Taxes	43,675,876	60,095,888	103,167,854	102,207,625	121,799,219
Taxes§	13,078,899	19,755,602	35,027,965	45,756,695	64,788,315
Corporate Net Income	30,596,977	40,340,286	68,139,889	56,450,930	57,010,904
Dividends	15,882,110	26,454,732	51,650,117	48,337,435	
Total Expenses	219,908,650	389,403,968	517,790,628	673,657,110	992,037,417

*Compiled from Census Reports, "Street and Electric Railways," 1902, 1907, 1912, 1917.
†Compiled by H. B. Dorau, of the Institute for Research in Land Economics and Public Utilities, from Census Preliminary Reports for 1922.
‡In this and subsequent tables Gross Receipts equal Operating Revenue plus Non-Operating Income.
§"Assignable to Railway Operations."

TABLE II. TAXATION OF STREET AND ELECTRIC RAILWAYS—UNITED STATES

Ratio of Taxes to Designated Items Expressed as a Percentage

Item	1902	1907	1912	1917	1922
Gross Receipts	5.22	4.60	5.98	6.27	6.18
Operating Revenue	5.25	4.72	6.14	6.43	6.35
Net Operating Revenue	12.43	11.84	14.93	17.79	22.42
Gross Income	12.09	11.07	13.84	16.49	20.17
Net Income before Taxes	29.95	32.87	33.95	44.77	53.19
Corporate Net Income	42.75	48.97	51.41	81.06	113.64
Dividends	82.35	74.68	67.82	94.66	.....
Total Expenses	5.95	5.07	6.76	6.79	6.53

agreement is more nearly unanimous than the general principle of equalization of tax burdens among the various fields of industry and various classes of tax-payers.

But as Justice Ranney of the Ohio Supreme Court once remarked in the course of a dissenting opinion, "it is said the constitution proclaims equality of burdens in taxation as its great cardinal principle. I admit it; and assert that it also *means* equality." [5] It is when we undertake to discuss an equality that *means* equality that something more is involved than merely a comparison of rates and methods. Equality in this sense is a matter of substance and of actual results; and the ascertainment of the fact or absence of such equality of burden involves the most careful and searching investigation.

The second development, which has made investigation both more necessary and more difficult, is the changed incidence of public utility taxation in consequence of the development of effective regulation. In private industry some taxes, such as net income and profits taxes, can be shifted little, if at all, by the corporations or individuals on whom they are levied; other taxes are shifted down a long "waiting list" and finally spread in varying proportions over stockholders, consumers, and other groups, depending upon the nature of the demand, conditions of competition, and other factors. Under regulation, taxes are included in the calculation of expenses, and rates are fixed which, it is intended at least, will yield a revenue sufficient to cover expenses and a fair return upon the property; and however far regulation sometimes falls short of providing the fair return, it seldom fails to cover expenses—which means that taxes, along with other expenses,

[5] *Exchange Bank of Columbus* v. *Hines*, 3 Ohio St. 1.

Chart I

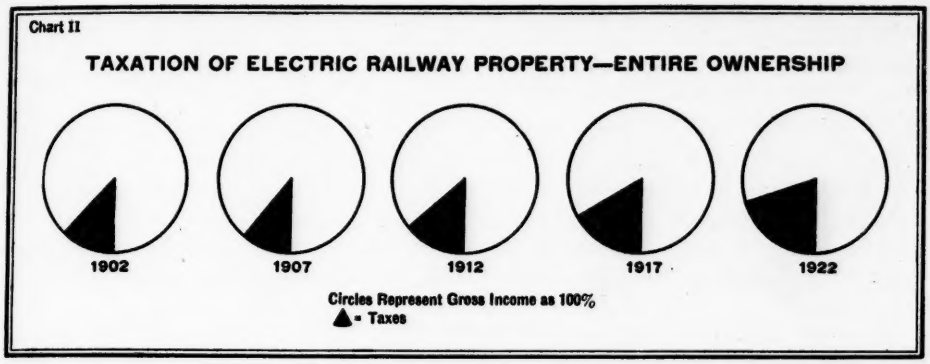
TAXATION OF ELECTRIC RAILWAY PATRONS

Circles Represent Total Operating Revenue as 100%

▲ Percentage of Operating Revenue Absorbed by Taxes

▲ Percentage of Operating Revenue Absorbed by All Other Expenses

△ Percentage of Operating Revenue Saved to Net Income



are thus made a direct charge upon the consumers of the industry.

If this sounds theoretical, one has but to read the decisions of the courts and the reports of commission proceedings in rate cases. The Ohio Public Utilities Commission, for example, will be found figuring taxes down to the cost per ton of hauling coal from Nelsonville to Toledo, as follows:

Line haul and assembling	51.294 cents
Excise tax	3.20
Other taxes	1.5
Rentals	1.11
Switching charges	7.28
Total	64.384

and on the basis of these figures calculating a profit of 15.62 cents per ton as necessary to yield a fair return upon the investment, and establishing a rate of 80 cents.[6] The reasoning of the commission makes it clear that if the "excise tax" had figured out 1 cent instead of 3.20, the freight rate on coal over the Hocking Valley from Nelsonville to Toledo would have been 78 cents, or some such figure, instead of 80 cents.

The Missouri Public Service Commission likewise, in 1918, not only calculated the tax cost of electric current on a kilowatt-hour basis but considered seriously whether a still more flexible provision might not be necessary to meet sudden changes in the amount of taxes, concluding:

> However, the commission does not believe that the price of wages and the item of taxes will be subject to such sudden and radical changes that it cannot be provided for in the nature of a fixed charge per kilowatt-hour.[7]

Two years later a United States court attached even the federal income tax to the gas meter with the following computation:

> These figures would become, for each 1,000 feet of gas, as follows:
>
	6%	7%
Including franchises	.0216	.0252
Excluding franchises	.0192	.0224
>
> *These figures must clearly be allowed.*[8]

And in 1922 Justice Brandeis, speaking for the United States Supreme Court, laid down as a general principle:

> In calculating whether the 5-cent fare will yield a proper return, it is necessary to deduct from gross revenue the expenses and

[6] *District No. 6, United Mine Workers of America* v. *Akron, Canton, and Youngstown Ry. Co. et al.*, Ohio Public Utilities Commission, Case No. 571, June 23, 1916.

[7] *Missouri Public Service Commission* re *Union Electric Light and Power Co.*, Nos. 1395, 1396, July 1, 1918.

[8] *Consolidated Gas Co. of New York* v. *Newton*, 267 Fed. 231; affirmed 258 U. S. 165. Italics our own.

charges; all taxes which would be payable if a fair return were earned are appropriate deductions. There is no difference in this respect between state and federal taxes, or *between income taxes and others.*[9]

A year later, the Texas Railroad Commission quoted this decision and went a step further by specifically enumerating even "excess profits taxes" among the charges to be considered in fixing rates.[10]

Since the Galveston decision and the reaffirmation of that ruling by the same court a year later,[11] the principle laid down by the Supreme Court has generally been followed by the state commissions, even where that involves the reluctant abandonment of a position previously taken by many commissions.[12]

An interesting example of a dual personality, legally speaking, obliged to consider the question of incidence from the standpoint of both regulation and taxation at the same moment, is afforded by a report of the Public Utility Committee of the Nevada State Board of Equalization. The chairman of the Public Service Commission, being in Nevada an ex-officio member of the Tax Commission and in this case chairman of the committee, reported:

> To raise the assessment to $87,000 plus will increase the taxes approximately $2,000, which must be added to expenses and therefore must be taken care of in the rates to be charged to the public. The committee recommends that this assessment be reduced.[13]

Here we have a working model of the incidence of taxes upon rates in the hands of a committee that has power over both.

It was left for the West Virginia Public Service Commission only to sup-

[9] *Galveston Electric Co.* v. *Galveston,* 258 U. S. 388, April 10, 1922. Italics our own.

[10] *San Antonio Public Service Co.* v. *City of San Antonio,* Aug. 30, 1923, P. U. R. Jan. 17, 1924.

[11] *Georgia Railway and Power Co. et al.* v. *Railroad Commission of Georgia,* 262 U. S. 624, June 11, 1923.

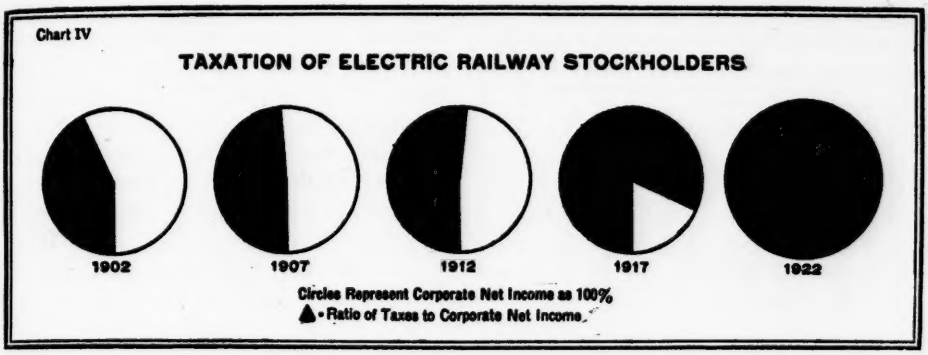
[12] For example, *Pennsylvania Public Service Commission, City of Philadelphia et al.* v. *Philadelphia Rapid Transit Co.,* 190 P. U. R. 1923E, June 21, 1923; *North Dakota Board of Railroad Commissioners* re *Northern States Power Co.,* 325 P. U. R. 1924A, Sept. 29, 1923; *California Railroad Commission* re *Coast Counties Gas and Electric Co.,* 415 P. U. R. 1924C, Oct. 27, 1923; *District of Columbia Public Utilities Commission, Federation of Citizens' Associations* v. *Chesapeake and Potomac Telephone Co.,* 152 P. U. R. 1924D, May 1, 1924.

[13] Mimeographed copy of *Report of the Committee,* before the State Tax Commission, Sept. 4, 1923, by courtesy of J. F. Shaughnessy, chairman of State Public Service Commission. Perhaps it should be added that the reduction recommended by the committee was a reduction not from a previous assessment but from a proposed increase in assessment.

Chart III

TAXATION OF ELECTRIC RAILWAY STOCKHOLDERS

Circles Represent Net Income before Taxes as 100%
▲- Taxes



ply an ethical basis for the above incidence of taxes:

> It is the duty of these patrons to contribute to the defendant company a sufficient amount of revenue to pay operating expenses and taxes.[14]

Probably no one will question the fairness of the above treatment of taxes (except in the case of net income and profits taxes, where there is considerable room for question),[15] but it might be said likewise that it is the duty of the "patrons" of agriculture and of other industries to contribute to the "defendants" a sufficient amount to pay operating expenses and taxes. The difference is that in regulation we have created official machinery for reminding patrons more or less effectively of this "duty," and therein lies a fundamental difference in the incidence of taxation in regulated and unregulated industry.

Of course, there are occasions when one "can lead a horse to water, but can't make him drink," and conditions under which the power, even of the most centralized authority, to levy taxes through the medium of regulation is limited by its inability to make higher rates effective in the form of net profits. In the case of the electric railways particularly, many grounds have been advanced for believing that taxes cannot be shifted—the customary 5-cent fare, motor competition, public opposition to rate increases, and other factors.[16] But most of these conditions peculiar to the electric railway field are now in process of being modified or controlled and only indicate in any case the difficulty of securing rate increases to compensate for increased expenses of any kind, not merely taxes.

All that it is meant to assert here is that taxes now have the same judicial and administrative status in rate making as other expenses; in short, that instead of taxes being distributed under the influence of random and varying conditions, to be sure, but still more or less widely over various participating classes, we now have "regulated" incidence as well as regulated rates and service.

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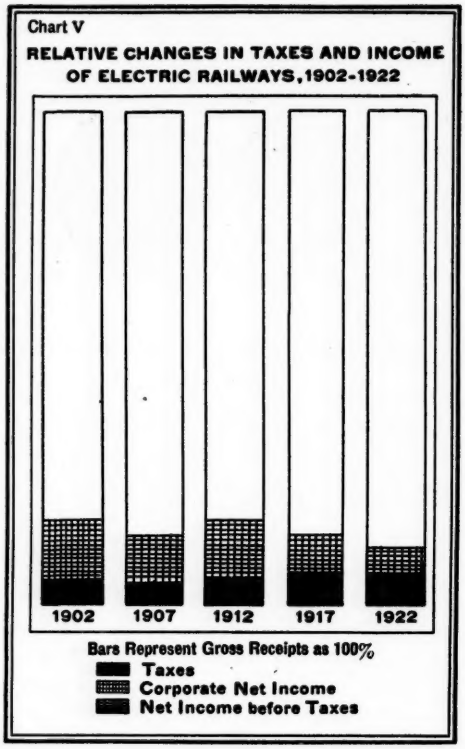
[14] *Meade Coal Co.* v. *Appalachian Power Co.*, Case No. 1333, P. U. R. 1923E, May 3, 1923.

[15] The treatment of net income and profits taxes by regulating commissions is still not entirely uniform, some commissions, even since the Galveston decision, holding that income taxes are not properly deductible in arriving at net income for purposes of determining a fair return. See for example, *State Corporation Commission of Virginia ex rel. Newport News* v. *Newport News Light and Water Co.*, 91 P. U. R. 1923D, Mar. 21, 1923.

[16] See papers and discussion of mid-year meeting of American Electric Railway Association, Washington, D. C., Feb. 16, 1923, published in *Aera*, March, 1923.



But this effect of regulation upon the incidence of taxes has probably made it still more difficult to ascertain the facts with regard to relative tax burdens. Even the little knowledge along this line that we have assumed in the past has been impaired by the tax legislation of recent years. The entrance of the Federal Government so largely into the field of direct taxation since 1913 has made it impossible to assert longer that the burden of federal taxation rests upon "consumers"; and the development of state income, inheritance, and other taxes from which the farmer is largely exempt, together with motor, gasoline, sales, and other miscellaneous taxes, makes it less certain than formerly that the farmer is now carrying a disproportionate share of state and local taxation.[17] Likewise at the other extreme, the seemingly safe prediction a few years ago that under the high rates of the federal income tax the wealthier taxpayers would now be carrying extreme burdens, has been largely nullified by the issue of some $30,000,000,000 of tax-exempt securities, which have provided honorable release from the income tax and left us in the dark again with respect to the actual distribution of the burden of federal taxation.[18]

II

In the field of public service taxation the most noteworthy recent studies are those of the New York Committee on Taxation and Retrenchment, under the chairmanship of Senator Davenport, with a research staff under the direction of Professor Robert Murray Haig, embodied in their report of March 1, 1922; and those of the recent Committee of the National Tax Association on the Taxation of Public Utilities, embodied in their reports at the annual conferences of the association in 1922 and 1923.

In an effort to contribute something further to a knowledge of the problem, particularly on the basis of the facts as they exist in Wisconsin, the Institute for Research in Land Economics and Public Utilities has for some time been making a study of the taxation of public service companies throughout the United States.

The statistical portion of this study has been based chiefly upon:

1. Census and Interstate Commerce Commission reports, reports and bulle-

[17] See *Report of United States Bureau of Agricultural Economics,* quoted p. 56 below.

[18] See *Report of the Federal Trade Commission on Taxation and Tax Exempt Incomes,* June 6, 1924, 68th Congress, 1st Session, Senate Document No. 148.

tins of the Comptroller of the Currency, the Federal Reserve Board, and the Bureau of Agricultural Economics.

2. The published statistics of state tax and public utility commissions.

3. Unpublished Wisconsin materials, including railroad and public utility reports to the State Railroad and State Tax Commissions, reports to the State Banking Department, corporate income tax returns to the State Tax Commission, and the income tax returns of firms and individuals to county assessors.

The present paper is intended merely as a preliminary report, and on account of limitation of space will be restricted to electric railway taxation and to tabulations of some general tax data of other groups of public service corporations, banks, and farmers for comparison with electric railway taxes. The more detailed analyses of the taxes of other public service groups and comparisons of public service taxation with the taxation of business corporations, firms, and individuals in Wisconsin will be reserved for later treatment.

III

Table I presents condensed income data for all operating electric railways

TABLE III. TAXATION OF STEAM RAILROADS

Ratio of Taxes to Designated Items Expressed as a Percentage *

Year	Gross Receipts	Operating Revenue	Net Operating Revenue	Gross Income	Net Income before Taxes	Corporate Net Income	Dividends Paid	Total Expenses
1900	2.93	3.25	9.20	7.02	17.54	21.27	34.62	3.40
1901	2.88	3.21	9.13	6.90	17.42	21.09	32.50	3.34
1902	2.83	3.15	8.93	6.75	16.27	19.43	29.38	3.32
1903	2.75	3.04	8.99	6.81	16.33	19.52	29.41	3.20
1904	2.82	3.12	9.70	7.27	18.12	22.13	27.80	3.23
1905	2.74	3.05	9.17	6.87	16.25	19.41	26.67	3.19
1906	2.90	3.22	9.48	7.15	16.26	19.42	27.41	3.40
1907	2.79	3.10	9.55	7.13	15.16	17.87	26.07	3.31
1908	2.98	3.53	11.68	7.54	16.00	19.04	21.66	3.54
1909	3.24	3.74	11.06	7.93	17.03	20.53	28.21	3.85
1910	3.24	3.77	11.19	7.88	15.11	17.80	25.59	3.97
1911	3.23	3.66	11.62	8.55	16.78	20.17	24.84	3.84
1912	3.58	3.95	12.94	9.97	21.46	27.32	32.19	4.12
1913	3.56	3.96	12.90	9.93	19.86	24.79	37.36	4.15
1914	4.19	4.68	16.73	12.53	28.37	39.61	36.93	4.69
1915	4.36	4.78	16.15	12.57	30.26	43.40	52.81	4.85
1916	4.09	4.44	12.82	10.54	19.91	24.87	53.20	4.90
1917	4.99	5.45	18.49	14.56	26.96	36.92	68.33	5.77
1918†	4.29	4.69	25.47	17.83	46.03	85.29	83.08	4.52
1919†	4.31	4.63	31.98	22.14	74.59	293.49	85.46	4.37
1920	3.70	4.51	67.16	16.34	35.43	54.87	86.93	3.97
1921	4.70	5.13	29.70	20.06	47.41	90.17	70.55	4.96
1922	5.18	5.51	26.78	20.49	45.19	82.45	112.72	5.52
1923	....	5.29	23.81	....	....	....	....	....

*Compiled from *Interstate Commerce Commission Reports*. Figures for 1900-1910, inclusive, are for all railways; 1911-1923 inclusive, for Class I carriers. Figures for 1900-1916 are for fiscal years; 1917-1923 for calendar years.

†Government operation makes it impossible to present figures for 1918 and 1919 that will be analogous to other data in the table. The figures here presented reflect the results of the operation of the roads and the total taxes paid by or for account of the roads, regardless of the distribution of income or of tax payments between the government and the railroad companies.

in the United States. In the 20-year period gross receipts have almost exactly quadrupled, operating expenses and taxes are each almost exactly five times as much in 1922 as in 1902, fixed charges are three times as much, the operating ratio has risen from 57½ to 71½, and net income has a little less than doubled.

Table II presents the same results in percentage form. It may be questioned whether the ratio to gross receipts or to operating revenue best measures the tax burden in terms of a "gross earnings" tax. If taxes reported by the companies actually include only "taxes assignable to railway operations," operating revenue should, of course, be the basis of comparison. There is reason to believe, however, from the form of the census schedules and the nature of some of the items, that the tax item sometimes includes taxes on the property or business from which "non-operating income" is derived. For this reason and also for the reason that in some states, as in Ohio, gross earnings taxes upon public utility corporations are construed to apply to earnings from all business transacted, whether in connection with the public utility service or not, we shall use the gross receipts ratio in most of our subsequent comparisons, although the effect will be to *understate* somewhat the tax ratio in terms of a gross earnings tax, as that tax is construed in most of the states that employ it.

Taxes in terms of gross receipts reached the minimum in 1907 and the maximum 10 years later. The striking feature is the comparatively slight increase of the gross receipts ratio, the three periods prior to the war averaging 5¼%, the two periods after the war 6.22%, an increase of only 18%, and an increase of a fraction under 20% for the entire period from 1902 to 1922.

The ratio of taxes to operating revenue represents the burden of taxation on the consumers—not the amount of taxes *shifted* to the consumer, to be sure, since the ratio of taxes to operating revenue shows nothing with respect to changes in the rate of fare *in consequence of the application of the tax,* but the number of cents the car rider pays to the government out of every dollar's worth of street car fares purchased. In 1902 this was 5.25 cents, in 1922, 6.35. (Chart I.)

The burden of taxation upon the property as a whole, regardless of the

TABLE IV. TAXATION OF TELEGRAPH COMPANIES IN THE UNITED STATES

Ratio of Taxes to Designated Items
Expressed as a Percentage *

Item	1902	1907	1912	1917	(Western Union Telegraph Co.) 1922
Gross Receipts	1.44	1.72	2.01	4.40	4.64
Operating Revenue	1.67	1.99	2.16	4.48	4.72
Net Operating Revenue	6.76	20.30	16.63	20.91	22.27
Gross Income	4.11	7.76	10.51	19.29	20.72
Net Income before Taxes	5.57	11.72	24.81	25.23	30.83
Corporate Net Income	5.90	13.27	33.00	33.74	44.57
Total Expenses	1.90	1.97	2.14	5.06	5.18

*Based on Census Reports, "Telephones and Telegraphs," 1902 and 1907; "Census of Electrical Industries—Telegraphs," 1917.

division of burden among the various equities concerned (stockholders, bondholders and other creditors, lessors, and the government), is measured by the ratio to gross income, which reflects an increase of 67%. (Chart II.)

The burden upon the stockholders, as one group of taxpayers, is measured by the ratio to net income before taxes, which represents the government starting with 30% in 1902 and "buying into" the property through the medium of taxation until, in 1922, it held the position of a "majority stockholder," taking 53% of all income after expenses and charges. The figures appear to suggest some discrepancy between the process of incidence described above and the results here indicated, a discrepancy which is to some extent only apparent but to some extent actual; and we shall not attempt at this point to explain the differences or to reconcile the law and statistics, both of which have their limitations. (Charts III and IV.)

The tables and charts at once raise the question whether, in considering electric railway taxation, we are thinking of the electric railway *business*, of electric railway *property* (as measured by the entire "net earnings" available for distribution and ordinarily reflected in the market value of the securities) or of electric railway *income*, in the sense of business profits to the stockholders. Taxation of the electric railway business shows only a very moderate increase; taxation of electric railway property, in the sense of the entire ownership, shows a very considerable but not abnormal increase; taxation of electric railway income has risen to a point which subjects electric railways to a rate (53%) higher than the maximum normal and surtax rates combined of our present federal income tax.

From the stockholder's standpoint the question in turn presents itself whether this situation has been brought about by a change in his taxes or in his income; that is, an increase in his taxes or a decrease in his income. In Chart I it is apparent that the nether millstone of taxes remains relatively fixed; it is the upper millstone of "other expenses" that keeps grinding relentlessly upon the slender grist of net income remaining. Chart V, representing the facts already discussed, may help to visualize the problem from the standpoint of the electric railway stockholder.

Here taxes absorb only a slightly increasing proportion of operating revenue; it is the steadily sinking stratum

TABLE V. TAXATION OF TELEPHONE COMPANIES

Ratio of Taxes to Designated Items
Expressed as a Percentage *

Item	1902†	1907†	1912†	1917†	1922‡
Gross Receipts	3.39	3.52	4.87	6.50	7.14
Operating Revenue	3.61	3.77	5.09	6.64	7.34
Net Operating Revenue	9.57	9.12	16.24	22.21	26.19
Gross Income	8.18	8.00	14.12	20.72	23.77
Net Income before Taxes	11.97	13.10	19.47	28.90	32.62
Corporate Net Income	13.59	15.07	24.18	40.66	48.41
Dividends	19.65	26.18	36.38	57.14	70.87
Total Expenses	4.52	4.59	6.09	7.73	8.37

*Compiled from Census Reports, "Telephones," 1907, 1912, 1917, and 1922.
†Commercial and mutual companies, with revenues of $5,000 or over.
‡All companies with revenues of $10,000 or over.

of net income on a substratum of rigidly fixed taxation that portends trouble.

IV

Before drawing conclusions it will be helpful to compare these facts with the trend of taxation in other groups of public service industries. Limitations of space make it necessary to omit the original data and present here only the percentage results.

Table III records the history of railroad taxation since 1900.

Taxes in terms of gross receipts reached their lowest point at about the same time as in the case of the electric railways, in the period 1903-1907, but rose almost uninterruptedly to a peak in 1922. Railroad taxes, by all measures, show a more striking increase than electric railway taxes, apparently because they began on a much lower level, but still stand in 1922 below the level of electric railway taxes by every measure except the ratio to net operating revenue (which reflects the higher operating ratio of the steam roads), and the ratio to gross income (which likewise reflects the operating ratio modified by a slightly higher proportion of non-operating income on the part of the steam roads). The general trend, however, is very similar, with taxes in 1922 taking slightly less than half of all the income available after expenses and charges in the case of the steam roads, and slightly more than half in the case of the electric railways.

Table IV presents the taxation of telegraph companies to 1917, the latest Census data available at the time of writing. Income and tax data for the Western Union Telegraph Company for 1922 are appended for purposes of comparison.[19] The striking fact here is the low level of taxation at the beginning of the period (equivalent to a gross receipts tax of 1½% in 1902), the rapid rate of increase since that time, and the fact that even with that rapid increase telegraph companies were still less heavily taxed in 1917 than electric railways by all measures except net operating revenue and gross income.

Telephone company taxes in Table V reflect heavier taxation in terms of gross receipts and total expenses than any of the groups thus far shown and taxa-

[19] The Western Union Telegraph Company represented 76% of operating revenue of all telegraph companies reporting to the Interstate Commerce Commission in 1922. Interstate Commerce Commission Report, *Statistics of Railways*, 1922, p. cx.

TABLE VI. TAXATION OF ELECTRIC LIGHT AND POWER COMPANIES

Ratio of Taxes to Designated Items
Expressed as a Percentage *

Item	1902	1907	1912	1917
Gross Receipts	3.37	3.93	4.70	6.14
Operating Revenue	3.43	4.07	4.96	6.46
Net Operating Revenue	8.69	9.31	11.82	16.77
Gross Income	8.31	8.60	10.45	14.77
Net Income before Taxes	14.31	14.39	17.60	24.63
Corporate Net Income	16.70	16.81	21.37	32.67
Dividends	42.89	32.88	37.93	46.29
Total Expenses	4.23	5.12	6.03	7.57

*Compiled from Census Reports, "Central Electric Light and Power Stations," 1902, 1907, 1912, 1917. "Commercial Companies."

TABLE VII. TAXATION OF NATIONAL BANKS

Ratio of Taxes to Designated Items
Expressed as a Percentage *

Item	1918	1919	1920	1921	1922	1923
Gross Earnings	6.51	7.14	7.17	7.27	7.44	6.42
Total Expenses†	8.87	9.70	9.61	8.87	8.98	7.97
Net Income	24.47	27.06	28.18	40.44	43.22	33.13
Net Income before Taxes	19.66	21.30	21.98	28.80	30.18	24.88
Dividends	40.03	47.98	53.78	55.26	47.85	37.62

*Calculated on basis of Reports of Comptroller of the Currency for years 1918-1923. Figures are for fiscal years.
†Adjusted for losses and recoveries on "Charged-off Assets."

tion in terms of net income heavier than that of telegraph companies but distinctly lower than in the case of either electric railways or steam roads.

The contrasts in the taxation of electric light and power companies, in Table VI, are interesting and more or less characteristic of the differences in burdens among the different groups of utilities.

Electric light and power company taxes began at a lower level, measured by every norm, and crept up until in the last year of comparison available (1917) they approximately equaled those of electric railways in terms of gross receipts and total expenses. In fact, the taxes in the two fields are very similar through gross receipts, net operating revenue, and gross income. The sharp difference in burden from there on reflects largely the differences in capital structure—interest and other charges absorbing 24½% of the operating revenue of electric railways and only 17½% of operating revenue of electric light and power companies.

It should be kept in mind, however, that in the Census tabulations the railway data and electric light and power data of joint-service companies are not entirely segregated. Instructions to agents and reporting companies are, where possible, to make complete separate reports for the two services; where this is not possible, combined reports are made; so that the railway tabulations include some light and power service, and the light and power tabulations do not include all the light and power services of joint-service companies.

Two industries of national scope, outside of the public service field, which afford materials for immediate comparison are banking and agriculture.

Table VII presents some comparable data for national banks, Table VIII for the state banks and trust companies in the Federal Reserve System. The outstanding features of the two tables are the relative steadiness of the gross earnings ratios, their general similarity to the corresponding ratios of public service companies, and the materially lower tax burden as measured in income.

Table IX presents some limited but

TABLE VIII. TAXATION OF STATE BANKS AND TRUST COMPANIES

Ratio of Taxes to Designated Items
Expressed as a Percentage *

Item	1919	1920	1921	1922	1923
Gross Earnings	5.84	5.24	5.69	5.93	5.04
Total Expenses†	7.75	6.91	7.17	7.34	6.49
Net Income	23.61	21.65	27.55	30.93	22.55
Net Income before Taxes	19.10	17.80	21.60	23.62	18.40
Dividends	39.83	39.12	44.34	44.56	34.76

*Calculation based on Federal Reserve Bulletins, 1919-1924. Includes only members of Federal Reserve System. Figures are for fiscal years.
†Adjusted for losses and recoveries on "Charged-off Assets."

interesting data on farm taxes, based on materials collected by the United States Department of Agriculture and recast into form as nearly as possible comparable to the public service and banking data already presented. The only change made in the original data is the inclusion among farm receipts of an estimate of $240 for the rental value of the home.[20]

The average size of farms reporting is above the average for the United States and presumably represents somewhat more than the average prosperity for farms as a whole. The number reporting is likewise a very small sample and may or may not be representative of the agricultural situation in general.

The striking features of the tabulation are the low return on the investment, the absence of anything that could be called business profits, the similarity of the gross receipts ratio to the same ratio for the public service corporations, and the lower burden in terms of net income than in the case of either the railroads or the electric railways. The ratio of taxes to total expenses, however, runs materially higher than for railroads or electric railways and is presumably, as in the case also of the telephone and the electric light and power companies, a reflection of low labor costs in the three industries—due largely to mechanical substitution in the case

[20] United States Department of Agriculture *Bulletin* No. 1214, Jan., 1924, estimates rental value of homes in section surveyed at $234. Previous Department of Agriculture estimates run much lower.

TABLE IX. TAXATION OF FARMS *

Item	Average Receipts and Expenses per Farm Reporting 1922	1923	Ratio of Taxes to Designated Items Expressed as a Percentage 1922	1923
Number of Reports	6,094	16,183	.....	.....
Average Size of Farms (Acres)	255	300	.....	.....
Average Value of Farm, Real Estate and Personalty	$16,430	$17,490	.....	.....
Gross Receipts:				
Cash Sales	1,972	2,240	.....	.....
Food and Fuel	294	250	.....	.....
Rental Value of Home	240	240	.....	.....
Increase in Inventory	150	64	.....	.....
Total	$ 2,656	$ 2,794	6.55	6.80
Expenses:				
Cash Outlays	1,083	1,160	.....	.....
Labor of Owner and Family	716	870	.....	.....
Interest	230†	230	.....	.....
Total	$ 2,029	$ 2,260	.....	.....
Net Income before Taxes	627	534	27.75	35.58
Taxes	174	190	.....	.....
Net Income	$ 453	$ 344	38.41	55.23
Total Expenses	2,203	2,450	7.90	7.76

*United States Bureau of Agricultural Economics, *Preliminary Report*, "Returns from Farming on 6,094 Farms, 1922. Computed from Reports of 6,094 Individual Farms Operated by Their Owners," and "Farm Returns, 1923," in United States Department of Agriculture, *Crops and Markets*, July, 1924.

†Interest was not reported in 1922, and we have substituted that item as reported for 1923.

TABLE X. COMPARATIVE TAX BURDENS—1922

Item	Ratio of Taxes to Gross Receipts	Ratio of Taxes to Net Income before Taxes
Electric Railways	6.18	53.19
Steam Railroads	5.18	45.19
Farms	6.29	31.4*
Telephones	6.83	27.28
Banks	6.69†	26.4‡
Telegraphs	4.40 (1917)	25.23(1917)
Western Union Telegraph Co.	4.64 (1923)	30.8 (1922)
Electric Light and Power.	6.14 (1917)	24.63(1917)

*Average 1922 and 1923.

†National banks 7.44, state banks and trust companies 5.93, averaged in ratio of gross earnings.

‡National banks 30.2, state banks and trust companies 23.62, averaged as above.

of electric light and power plants, access to inexpensive labor supply in the case of the telephone companies, and poor accounting in the case of the farms.

From all the tabulations thus far presented three facts stand out:

1. The striking similarity of the gross receipts ratios;

2. The extreme variations of the tax burden in terms of net income;

3. An apparently disproportionate burden of taxation upon electric railways, as measured in net income. These results are brought together in Table X, in which the groups are arranged in order of tax burden on net income. The figures for telegraph companies and for electric light and power companies for 1922 are not available at the time of writing. The tax ratios of the Western Union Telegraph Company for 1922 are included for the sake of comparison.

Here we have five groups of industries in 1922 paying an average gross receipts tax of 6¼%, with no one of them varying more than 17% from the average rate (the lowest—steam railroads—being 17% below, and the highest—telephones—10% above the average rate) and yet paying the equivalent of net income taxes varying all the way from 26% to 53%. Strangely enough, the actual tax burden varies almost inversely with the gross receipts ratio, since these same groups arranged in order of gross receipts ratio would stand:

Telephones
Banks
Farms
Electric Railways
Steam Railroads

If the first column in the table were titled "Taxes" and the second "Tax Burdens," it might better suggest their real significance.

The relations of the different groups are represented in Chart VI below.

The general objection to a gross

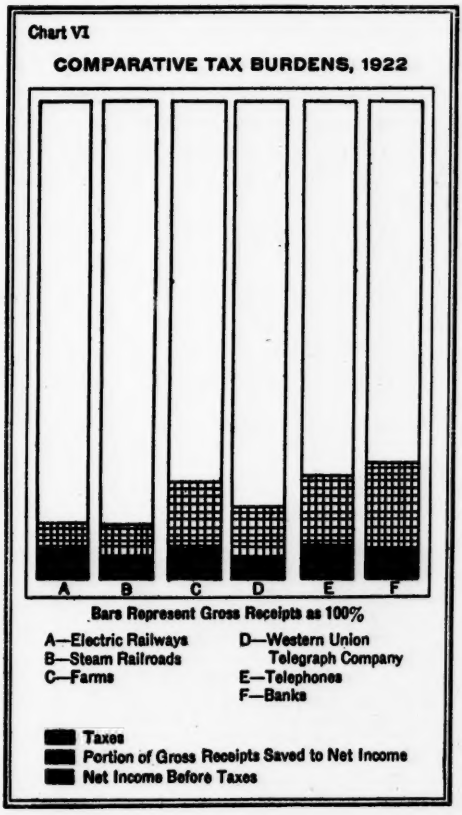


TABLE XI. TAXATION OF ELECTRIC RAILWAYS IN WISCONSIN
Condensed Income Account *

Item	1902	1907	1912	1917	1922
Gross Receipts	$3,923,884	$6,662,817	$8,648,124	$8,972,094	$14,185,945
Operating Revenue	3,902,059	6,135,064	7,846,593	8,366,664†	13,112,252†
Operating Expenses	1,995,024	3,235,068	4,105,913	5,382,667†	10,222,943†
Net Operating Revenue	1,907,035	2,899,996	3,740,680	2,983,997	2,889,309
Non-Operating Income	21,825	527,753	801,531	213,801	227,056
Gross Income	1,928,860	3,427,749	4,542,211	3,197,798	3,116,365
Interest, Rentals, and Other Deductions	931,101	1,854,963	2,427,047	1,896,122	2,512,558
Net Income before Taxes	997,759	1,572,786	2,115,164	1,301,676	603,807
Taxes	150,059	325,966	504,665	627,346‡	1,017,697‡
Corporate Net Income	847,700	1,246,820	1,610,499	674,330	413,890§
Dividends	300,563	1,068,187	1,449,980	817,055	
Total Expenses	3,076,184	5,415,997	7,090,545	8,297,764	14,599,835

*Operating companies. Compiled from Census Reports, "Street and Electric Railways," 1902, 1907, 1912, 1917, and Department of Commerce press release of October 26, 1923.
†Railway Operating Revenue and Expenses.
‡"Assignable to Railway Operations."
§Deficit.

earnings tax is its failure to take account of differences in operating conditions and in tax-paying ability as measured by net income; but it would be difficult to levy a tax with less flexibility of adjustment or with more indiscriminate results than those here indicated, particularly when it is recalled that the effects of the property and miscellaneous taxes that make up the greater part of the tax totals are here modified by the inclusion of one large element of income taxation, namely, the federal corporate income tax. The amount of federal income taxes included in the above totals cannot, of course, be calculated simply by applying the federal tax rate to net income, since taxable net income and net income as reported here are not exactly the same things and since there is considerable lag between income tax payments and the corresponding income on which the taxes are paid. But at least an approximate reflection of the equilibrating effect of the federal income tax will be secured if we apply the federal income tax rate to the corporate net income of these groups as reported for 1922, deduct that amount from total taxes, and take the ratios of remaining taxes to net income. An application of this rough-

TABLE XII. TAXATION OF ELECTRIC RAILWAYS IN WISCONSIN
Ratio of Taxes to Designated Items
Expressed as a Percentage

Item	1902	1907	1912	1917	1922
Gross Receipts	3.82	4.89	5.84	6.99	7.17
Operating Revenue	3.86	5.31	6.43	7.50	7.76
Net Operating Revenue	7.87	11.24	13.49	21.02	35.22
Gross Income	7.78	9.51	11.11	19.62	32.66
Net Income before Taxes	15.04	20.73	23.86	48.20	168.55
Corporate Net Income	17.70	26.14	31.34	93.03	Def.
Dividends	49.93	30.52	34.80	76.78	...*
Total Expenses	4.88	6.02	7.12	7.56	6.97

*Not available.

and-ready method to the data for 1922 yields the following results:

Ratio of taxes other than federal income taxes to net income before taxes.

	Percentage
Electric Railways	47.0
Steam Railroads	39.7
Farms	31.4 [21]
Telephones	25.9
Banks	19.0

Deprived of the equalizing effect of the federal income tax, the discrepancies in tax burdens stand out the more clearly, farms carrying a burden one and a half times to twice that of banks, and electric railways two and a half times that of the banks.

These facts alone certainly do not afford grounds for drawing any general conclusions; yet it is difficult in the face of them to avoid the feeling that the expensiveness, uncertainties, disputes, and litigation of a property and ad valorem system of taxes are largely wasted if this is the result of it all. A straight gross earnings tax—indeed a *uniform* gross earnings rate spread over all of these groups of industries could hardly be more inflexible and more violently regressive than our present methods, if the facts here presented are at all representative of conditions over a longer period of time.

[21] The amount of federal income taxes paid on the earnings of farms reporting average net incomes of $453 and $334 must be negligible, and we have retained in the tabulation the same figures as in Table IX, page 56.

V

Unfortunately the Census materials do not afford accurate comparisons of the tax situation in individual states, on account of the inclusion of federal along with state and local taxes, the varying proportions of "auxiliary revenues" (chiefly for electric light and power service) reported by electric railways in different states, the varying import of "taxes assignable to railway opera-

TABLE XIII. TAXATION OF ELECTRIC RAILWAY SERVICE IN WISCONSIN

All Electric Railway Service
Condensed Income Account *

Item	1920	1921	1922
Gross Receipts	$15,744,455.39	$14,951,591.98	$15,212,755.68
Operating Revenue	15,687,837.02	14,902,344.17	15,156,911.05
Operating Expense	13,446,623.61	12,361,542.18	11,987,333.78
Net Operating Revenue	2,241,213.41	2,540,801.99	3,169,577.27
Non-Operating Income†	56,618.37	49,247.81	55,844.63
Gross Income	2,297,831.78	2,590,049.80	3,225,421.90
Interest, Rentals, and Other Deductions‡	1,961,038.14	2,400,438.31	2,368,467.32
Net Income before Taxes	336,793.64	189,611.49	856,954.58
Taxes	734,006.03	830,434.32	1,017,779.77
State and Local	461,377.64	549,092.01	706,450.04
Federal	272,628.39	281,342.31	311,329.73
Corporate Net Income	§397,212.39	§640,822.83	§160,825.19
Total Expenses	16,141,667.78	15,592,414.81	15,373,580.87

*Calendar Years.
†Includes both "Utility Non-Operating Income" and "Corporate Non-Operating Income."
‡Excluding "Contractual Sinking Fund Requirements."
§Deficit.

TABLE XIV. TAXATION OF ELECTRIC RAILWAY SERVICE IN WISCONSIN

All Electric Railway Service
Ratio of Total Taxes to Designated Items
Expressed as a Percentage

Item	1920	1921	1922	Three-Year Average*
Gross Receipts	4.66	5.55	6.69	5.62
Operating Revenue	4.68	5.57	6.71	5.64
Net Operating Revenue	32.75	32.68	32.11	32.47
Gross Income	31.94	32.06	31.55	31.83
Net Income before Taxes	217.94	437.97	118.77	186.66
Corporate Net Income	Deficit	Deficit	Deficit	Deficit
Total Expenses	4.55	5.33	6.62	5.48

*The three-year average in this and subsequent tables is not the arithmetic average of the several ratios shown in the tables but the ratio of aggregate taxes for the three years to the aggregates of the various other items with which taxes are compared.

tions," and the assignment of "companies" rather than exact mileage to the various states. But while fair comparisons of individual states are not possible, it is nevertheless possible to draw a few general inferences with respect to large groups of states.

In 23 states electric railway taxes absorb more than 50% of net income before taxes.[22] When it is recalled that the government is not only a preferred creditor to that amount but that through regulation, banking control, regulatory legislation, liability and insurance requirements, paving requirements and other municipal ordinances the govern-

[22] These states are: Arizona, Arkansas, California, Colorado, Idaho, Kansas, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, Nevada, North Dakota, Oregon, South Carolina, South Dakota, Utah, Washington, Wisconsin, Wyoming. By courtesy of H. B. Dorau, of the Institute for Research in Land Economics and Public Utilities, who has compiled data for individual states from United States Department of Commerce press releases of October, November, December, 1923, and February, 1924.

TABLE XV. TAXATION OF ELECTRIC RAILWAYS

Single-Service Companies
Condensed Income Account *

Item	1920	1921	1922
Gross Receipts	$3,540,797.29	$3,367,089.71	$3,512,287.64
Operating Revenue	3,517,019.09	3,348,131.08	3,507,807.00
Operating Expense	2,706,950.37	2,664,408.37	2,738,496.59
Net Operating Revenue	810,068.72	683,722.71	769,310.41
Non-Operating Income	23,778.20	18,958.63	4,480.64
Gross Income	833,846.92	702,681.34	773,791.05
Interest, Rentals, and Other Deductions†	367,084.79	453,189.73	484,880.58
Net Income before Taxes	466,762.13	249,491.61	288,910.47
Taxes	134,898.80	211,740.26	218,255.77
Corporate Net Income	331,863.33	37,751.35	70,654.70
Total Expenses	3,208,933.96	3,329,338.36	3,441,632.94

*Calendar years.
†Excluding "Contractual Sinking Fund Requirements."

TABLE XVI. TAXATION OF ELECTRIC RAILWAYS

Single-Service Companies

Ratio of Total Taxes to Designated Items Expressed as a Percentage

	1920	1921	1922	Three-Year Average*
Gross Receipts	3.81	6.29	6.21	5.42
Operating Revenue	3.84	6.32	6.22	5.45
Net Operating Revenue	16.65	30.97	28.37	24.96
Gross Income	16.18	30.13	28.21	24.45
Net Income before Taxes	28.90	84.87	75.54	56.20
Corporate Net Income	40.65	560.88	308.90	128.31
Total Expenses	4.20	6.36	6.34	5.66

*See footnote to Table XIV.

ment exercises a large degree of actual direction and control of the industry, it will be realized that the government is not so much a "preferred creditor" as a kind of "prior preference stockholder," with not only a prior lien on earnings but a very large voice in the management of the industry as well.

In 21 additional states taxes absorb more than one-third of net income before taxes.[23] In only 4 states do taxes absorb less than one-third of net income before taxes.[24]

Three observations are suggested by these compilations: 1. The area of "low barometer" corresponds roughly with the Atlantic and Southern states, and the pressure increases as we move to the Northwest and West, spreading at its maximum over the Rocky Mountains and the Pacific Coast. Of the 20 lowest states[25] 5 are New England states, 3 Middle Atlantic, 9 Southern (including West Virginia) and 2 East North Central, Oklahoma being the odd member of the group. Only 6 of the 20 are not on the seaboard, and only 3 can be located west of the Mississippi River even by including Louisiana in that number. Of the 20 highest states[26] 10 are Rocky Mountain and

[23] These states are: Alabama, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Ohio, Pennsylvania, Rhode Island, Tennessee, Texas, Vermont, Virginia, West Virginia.

[24] These states are: Florida, Michigan, North Carolina, Oklahoma.

[25] States enumerated in the second and third lists above, except Indiana, Iowa, Kentucky, Minnesota, and Ohio.

[26] States enumerated in the first list above, except Arkansas, New Hampshire, and Washington.

TABLE XVII. ELECTRIC RAILWAY SERVICE OF ALL COMPANIES HAVING BOTH ELECTRIC RAILWAY AND ELECTRIC LIGHT AND POWER SERVICES

Condensed Income Account

Item	1920	1921	1922
Gross Receipts	$12,217,615.38	$11,584,502.26	$11,708,213.55
Operating Revenue	12,170,848.62	11,554,213.39	11,656,845.80
Operating Expense	10,736,930.66	9,727,580.75	9,213,861.77
Net Operating Revenue*	1,433,917.96	1,826,632.64	2,442,984.03
Non-Operating Income	46,766.76	30,288.87	51,367.75
Gross Income	1,480,684.72	1,856,921.51	2,494,351.78
Interest, Rentals, and Other Deductions	1,595,093.35	1,947,247.56	1,876,872.18
Net Income before Taxes	†114,408.63	† 90,326.05	617,479.60
Taxes	601,661.14	618,488.85	818,340.11
Corporate Net Income	†716,069.77	†708,814.90	†200,860.51
Total Expenses	12,933,685.15	12,293,317.16	11,909,074.06

*Includes both "Utility Non-Operating Income" and "Corporate Non-Operating Income."
†Deficit.

TABLE XVIII. ELECTRIC RAILWAY SERVICE OF ALL COMPANIES HAVING BOTH ELECTRIC RAILWAY AND ELECTRIC LIGHT AND POWER SERVICES

Ratio of Total Taxes to Designated Items Expressed as a Percentage

Item	1920	1921	1922	Three-Year Average*
Gross Receipts	4.92	5.34	6.99	5.74
Operating Revenue	4.94	5.35	7.02	5.76
Net Operating Revenue	41.96	33.86	33.50	35.74
Gross Income	40.63	33.31	32.81	34.95
Net Income before Taxes	Deficit	Deficit	132.53	493.89
Corporate Net Income	Deficit	Deficit	Deficit	Deficit
Total Expenses	4.65	5.03	6.87	5.48

*See footnote to Table XIV.

Pacific states, 5 Western, 1 North Central, 2 Southern, and 2 Eastern. Only 5 are east of the Mississippi, and only 3 on the Atlantic seaboard.

Or if a line be drawn along the eastern boundary of Illinois to the Ohio River and thence following the Ohio and Mississippi to the Gulf, 24 states will lie west of the line and 24 east. Only 6 of the 24 states in the western half (Minnesota, Iowa, Illinois, Oklahoma, Louisiana, Texas) are not also in the upper half of the tax range, and only 6 of the 24 states in the eastern half (Mississippi, New York, South Carolina, New Jersey, New Hampshire, Indiana) are not also in the lower half of the tax range.

2. There appears to be little relation between the amount of taxes in terms of gross receipts or operating revenue and the tax burden in terms of net income, even the 10 states with the highest burden on net income showing an average of only 6.3% of operating revenue absorbed by taxes in comparison with a similar ratio of 5.5% for the 10 states with the lowest burden on net income.

3. The differences in burden appear, therefore, to be due not as much to differences in taxation as to differences in operating conditions, general industrial prosperity of the sections compared, differences in regulating policy, and other factors directly affecting net income.

VI

Turning now to a more detailed

TABLE XIX. TAXATION OF ELECTRIC LIGHT AND POWER INDUSTRY IN WISCONSIN

All Electric Light and Power Service

Condensed Income Account *

Item	1920†	1921‡	1922§
Gross Receipts	$20,522,848.88	$22,580,284.83	$24,914,761.00
Operating Revenue	20,017,601.91	22,082,687.98	24,425,914.28
Operating Expense	13,871,573.76	14,089,786.19	15,165,661.40
Net Operating Revenue	6,146,028.15	7,992,901.79	9,260,252.88
Non-Operating Income	505,246.97	497,596.85	488,846.72
Gross Income	6,651,275.12	8,490,498.64	9,749,099.60
Interest, Rentals, and Other Deductions‖	2,762,314.42	3,381,593.78	3,697,009.82
Net Income before Taxes	3,888,960.70	5,108,904.86	6,052,089.78
Taxes	1,240,868.22	1,475,519.44	1,765,535.98
Corporate Net Income	2,648,092.48	3,633,385.42	4,286,553.80
Total Expenses	17,874,756.40	18,946,899.41	20,628,207.20

*Calendar years.

‖Excluding "Contractual Sinking Fund Requirements."

†On account of incompleteness or inadequacy of reports, a number of small companies are omitted, representing an operating revenue of $956,904.81, out of total operating revenue for the state of $20,974,506.72, or 4-6/10%.

‡Operating revenue of smaller companies omitted equals $1,281,824.61, out of total operating revenue for the state of $23,364,512.59, or 5-4/10%.

§Operating revenue of smaller companies omitted equals $1,329,019.31, out of total operating revenue for the state of $25,750,933.59, or 5-2/10%.

TABLE XX. TAXATION OF ELECTRIC LIGHT AND POWER INDUSTRY IN WISCONSIN

All Electric Light and Power Service

Ratio of Total Taxes to Designated Items Expressed as a Percentage

Item	1920	1921	1922	Three-Year Average*
Gross Receipts	6.05	6.53	7.09	6.59
Operating Revenue	6.20	6.68	7.23	6.74
Net Operating Revenue	20.19	18.46	19.07	19.15
Gross Income	18.66	17.38	18.11	18.01
Net Income before Taxes	31.91	28.88	29.17	29.78
Corporate Net Income	46.86	40.61	41.19	42.41
Total Expenses	6.94	7.79	8.56	7.80

*See footnote to Table XIV.

analysis of electric railway taxes in Wisconsin, it may be stated that Wisconsin is one of the few states in which electric railways are entirely subject to ad valorem assessment by the State Tax Commission and to taxation at the average rate on general property throughout the state. This applies to all companies having electric railway service and to all operative property; companies are assessed as units, with no attempt to apportion assessments or taxes among the various services that may be operated in connection with electric railway service.

It will be of interest to present first, as a general background, the data for the five-year periods as reported by the Census. In Table XI revenue and expenses of "auxiliary operations," which are separately reported for 1917 and 1922, have been excluded. Perhaps the most striking feature of the exhibit for Wisconsin is the increase in taxes from $627,000 in 1917 to over $1,000,000 in 1922, an increase of 62.2%, and the still greater increase of operating expenses (89.9%). Wages and salaries alone, as reported for those years, show an increase of 93.5%.

Table XII represents the same facts in terms of percentages. The omission of auxiliary revenue and expenses, of course, reduces the net income and greatly increases the tax ratios, making corporate net income in 1922 in fact a deficit. How far this represents the actual situation of the electric railway service and how far it may have to be qualified on account of the uncertainties of apportionment of expenses and

TABLE XXI. TAXATION OF ELECTRIC LIGHT AND POWER INDUSTRY IN WISCONSIN

Single-Service Companies

Condensed Income Account *

Item	1920	1921	1922
Gross Receipts	$3,986,906.19	[$4,903,365.15]	$5,065,066.13
Operating Revenue	3,811,947.42	4,738,987.91	4,888,996.71
Operating Expense	2,595,493.04	3,142,758.98	2,996,036.53
Net Operating Revenue	1,216,454.38	1,596,228.93	1,892,960.18
Non-Operating Income	174,958.77	164,377.24	176,069.42
Gross Income	1,391,413.15	1,760,606.17	2,069,029.60
Interest, Rentals, and Other Deductions	608,356.78	796,095.09	961,290.92
Net Income before Taxes	783,056.37	964,511.08	1,107,738.68
Taxes	305,316.30	372,073.82	430,421.01
Corporate Net Income	477,740.07	592,437.26	677,317.67
Total Expenses	3,509,166.12	4,310,927.89	4,387,748.46

*See Table XIX, notes.

TABLE XXII. TAXATION OF ELECTRIC LIGHT AND POWER INDUSTRY IN WISCONSIN

Single-Service Companies

Ratio of Total Taxes to Designated Items Expressed as a Percentage

Item	1920	1921	1922	Three-Year-Average*
Gross Receipts	7.66	7.59	8.50	7.94
Operating Revenue	8.01	7.85	8.80	8.24
Net Operating Revenue	25.10	23.31	22.74	23.54
Gross Income	21.94	21.13	20.80	21.22
Net Income before Taxes	38.99	38.58	38.86	38.80
Corporate Net Income	63.91	62.80	63.55	63.39
Total Expenses	8.70	8.63	9.81	8.39

*See footnote to Table XIV.

charges between the electric railway service and electric light and power service of joint utility companies will be discussed below.

Tables XIII and XIV present the taxation of electric railway service in Wisconsin since 1920, as derived from reports of the companies to the State Tax Commission and State Railroad Commission. Our tabulation for 1922 differs from that of the Census for the same year in the fact that it is intended to include all the electric railways of the state, to apply only to the mileage within the state, and to include only the *railway service* in the case of joint-service companies.

In the case of joint-service companies interest and fixed charges have been apportioned to the different services:

1. On the basis of the company's apportionment, where such apportionment is reported;

2. Otherwise on the basis of property account;

3. In a few cases, where property account is not available or inadequate, on the basis of operating revenue.

Total taxes, state and federal, assignable to railway service, are reported (in total) by the companies to the Railroad Commission. State taxes are assessed and reported by the Tax Commission—for companies, not for services. In the case of joint-service companies, therefore, state taxes have been apportioned among the different services:

1. On the combined ratio of property values and net operating revenue;

TABLE XXIII. ELECTRIC LIGHT AND POWER SERVICE OF ALL COMPANIES HAVING BOTH ELECTRIC RAILWAY AND ELECTRIC LIGHT AND POWER SERVICE

Condensed Income Account *

Item	1920	1921	1922
Gross Receipts	$14,067,385.74	$14,894,226.37	$16,296,808.35
Operating Revenue	13,713,835.31	14,542,735.06	16,086,665.18
Operating Expense	9,511,075.17	9,143,349.03	9,958,311.14
Net Operating Revenue	4,202,760.14	5,399,386.03	6,128,354.04
Non-Operating Income†	353,550.43	351,491.31	210,143.17
Gross Income	4,556,310.57	5,750,877.34	6,338,497.21
Interest, Rentals, and Other Deductions	1,766,661.69	2,215,793.77	2,429,017.59
Net Income before Taxes	2,789,648.88	3,535,083.57	3,909,479.62
Taxes	765,293.26	862,211.48	1,053,410.33
Corporate Net Income	2,024,355.62	2,672,872.09	2,856,069.29
Total Expenses	12,043,030.12	12,221,354.28	13,440,739.06

*See Table XIX, notes.
†Includes both "Utility Non-Operating Income" and "Corporate Non-Operating Income."

2. Where property account was inadequate, on the basis of net operating revenue;

3. In a few cases where a deficit occurred in net operating revenue, on the basis of property account alone. Federal taxes have been arrived at by subtracting state taxes, apportioned to railway service, from the total taxes as reported for the service to the Railroad Commission, and are subject, therefore, to considerable inaccuracy for any particular year, which, however, should be smoothed out over a period of two or three consecutive years.

By connecting the Census data of 1917 with our own for 1920-1922, two striking trends are brought into view, one from 1917 to 1920, and another from 1920 to 1922. Operating revenue in 1920 was nearly double that of 1917; but operating expenses were two and a half times as great, interest and rentals little changed, while taxes show only a modest increase—considering the period—of 17%; in fact, the ratio of taxes to gross receipts actually declined from 7.0% to 4.7%. Yet the increase in operating expenses was more than sufficient to offset the increase in operating revenue, and final net income dropped from $674,000 above the line to $397,000 below.

Here clearly is a case where the difficulties of the industry could not be charged in any degree to increases in tax burdens. Yet the tax system—entirely aside from the question of amount of taxes—is as clearly open to the charge of failing entirely to take account of tax-paying ability as measured in terms of actual income. It is difficult to discover any element of ability to pay or of equalization in a system of taxation under which an industry pays taxes of $627,000 when it has a net income before taxes of $1,302,000, and pays taxes of $734,000 when it has a net income of $337,000 before taxes and a deficit of $397,000 after.

TABLE XXIV. ELECTRIC LIGHT AND POWER SERVICE OF ALL COMPANIES HAVING BOTH ELECTRIC RAILWAY AND ELECTRIC LIGHT AND POWER SERVICES

Ratio of Total Taxes to Designated Items Expressed as a Percentage

Item	1920	1921	1922	Three-Year Average*
Gross Receipts	7.60	5.79	6.46	5.92
Operating Revenue	5.58	5.93	6.55	6.05
Net Operating Revenue	18.21	15.95	17.19	17.04
Gross Income	16.80	14.99	16.62	16.11
Net Income before Taxes	27.43	24.39	26.95	26.20
Corporate Net Income	37.80	32.26	36.88	35.49
Total Expenses	6.35	7.05	7.84	7.11

*See footnote to Table XIV.

From 1920 to 1922 the story is exactly the reverse. Operating revenue declined slightly, operating expenses fell sharply; but taxes increased to an amount which offset the savings from operation and barely allowed the industry to come up for a breath in 1922. In short, taxes afforded no relief when operating expenses were crowding upon revenue, and absorbed the relief that did come with economic readjustment in 1921 and 1922.

In order to eliminate the influence of apportionment, particularly the apportionment of charges and taxes, among the different services of joint-service companies, the income and tax data of companies in Wisconsin having *only electric railway service* have been separately compiled, and are presented in Tables XV and XVI. These companies represented, in 1922, 23% of the total electric railway revenue of the state, the joint-service companies, 77%; the single-service companies represented in the same year average operating revenue of $351,000, the joint-service

companies, $1,060,000—a difference that is less significant when the influence of the one or two largest companies in the state upon the general average is considered.

The tax burden of the single-service companies is materially less than that of the entire electric railway service of the state, the single-service companies paying in taxes only 56% of their net income before taxes over the three-year period, while the entire electric railway service paid 187% of net income for the same period. The deficit in corporate net income disappears entirely. The ratio of taxes to total expenses is larger for the single-service companies, suggesting that the differences between the two groups are due chiefly to the heavier burden of other expenses, actual or apportioned, upon the railway service.

But if the single-service companies escaped with less than the average burden, it is obvious that the other members of the entire group, namely the joint-service companies, must have carried more than the average burden. The income and tax data for the joint-service companies have therefore been compiled and are presented in Tables XVII and XVIII.

The electric railway service of companies having both classes of service runs into a deficit, even before taxes, in 1920 and 1921, and pays in taxes nearly 500% of net income before taxes for the three-year period.

A comparison of the taxes of electric light and power service will be helpful at this point.

Tables XIX and XX present income data for all electric light and power service. For data other than taxes the sources are the same as for the electric railways.

Taxes have been derived as follows: Joint-service companies having electric railway service are subject to ad valorem assessment by the Tax Commission and to taxation at the average rate of taxation for the state, in lieu of other state and local taxes. For these companies, therefore, state taxes have been derived from the assessment rolls of the Tax Commission. For all other companies, state and local taxes have been derived from the income tax returns of the companies to the Tax Commission and apportioned as in the case of electric railways. For companies not having electric railway service, federal taxes are from the income tax returns of the companies. Companies having electric railway service do not report to the state Income Tax Department; for

TABLE XXV. COMPARISON OF JOINT- AND SINGLE-SERVICE COMPANIES
Ratio of Taxes to Designated Items Expressed as a Percentage

Three-Year Average 1920-1922	Single-Service Electric Railways	Railway Service of Companies Having both Railway and Light and Power Service	Electric Light and Power Service of Companies Having both Railway and Light and Power Service	Single-Service Electric Light and Power Companies
Gross Receipts	5.42	5.74	5.92	7.94
Operating Revenue	5.45	5.76	6.05	8.24
Net Operating Revenue	24.96	35.74	17.04	23.54
Gross Income	24.45	34.95	16.11	21.22
Net Income before Taxes	56.20	493.89	26.20	38.80
Corporate Net Income	128.31	Def.	35.49	63.39
Total Expenses	5.66	5.49	7.11	9.07

these companies, federal taxes are assumed as above to be the difference between the state taxes, as assessed by the Tax Commission, and the total taxes reported by the companies to the State Railroad Commission.

The contrast in tax burden on net income is obvious; but of more significance perhaps is the fact that single-service light and power companies do not escape with as small a burden (Tables XXI and XXII), and that the light and power service *of joint-service companies* (Tables XXIII and XXIV) fares best of all.

Apparently the union of electric railway and electric light and power services works to the disadvantage of the former and the advantage of the latter, either in actual operation, regulation, or accounting. Table XXV will help to visualize the contrasts.

A ready explanation of the striking differences in the situation of electric railway service, when that is a single service and when combined with light and power and other services, is that the differences are due to the assignment by joint-service companies of an undue proportion of expenses, especially of fixed charges and taxes, to the electric railway service.

A little inquiry, however, will develop at least four different factors that seem to contribute more or less to the result.

1. The first factor consists of differences in operating conditions, and perhaps to some extent differences in capital structure, of the joint-service and larger companies on the one hand and the single-service and smaller companies on the other—upon which, however, we have not yet sufficient facts to base any definite statement.

2. The second factor is the tendency of regulating bodies, under the influence of customary fares, public opposition to rate increases, potential motor competition, and other local conditions, to hold down electric railway fares more rigidly than electric light and power rates—a tendency which naturally cannot be supported by "citations," but which seems to be generally recognized and more or less candidly acknowledged by regulating authorities. The result is that profits of the light and power services are relied upon to average shortages in the railway service and yield an aggregate fair return on the business as a whole. So far as it works out to this result, the only parties aggrieved are the consumers of light and power services, who pay a little more than cost for electric current in order to secure street railway service, for themselves or their neighbors, at a little less than cost.

TABLE XXVI. COMPARISON OF TAXES AND FIXED CHARGES OF JOINT- AND SINGLE-SERVICE COMPANIES

Ratio of Operating Expenses, Charges, and Taxes to Total Expenses Expressed as a Percentage

Three-Year Average 1920-1922	Single-Service Electric Railways	Single-Service Electric Light and Power Companies	Electric Railway Service of Companies Having both Railway and Light and Power Services	Light and Power Service of Companies Having both Railway and Light and Power Services
Operating Expenses	81.26	71.55	79.92	75.89
Interest, Rentals, and Other Deductions	13.08	19.38	14.59	17.00
Taxes	5.66	9.07	5.49	7.11

3. In Wisconsin the ad valorem assessment of all companies having electric railway service is based on a composite average, of which one of the most important factors is the capitalization of net earnings. The flexible element afforded by the consideration of net earnings appears to operate more effectively, however, in the case of joint companies than of single-service companies. In the case of a single-service electric railway, for example, it is difficult for any assessing body to reduce the assessment by the full amount represented by the capitalization factor, if that factor is little or nothing; and the tendency apparently is, as earnings disappear, to rely more largely on a property basis of assessment. Indeed, it is doubtful whether any different method could be employed without encountering public criticism from other taxpayers whose taxes are based on ordinary property assessment, untempered by any consideration of earnings. An actual deficit, for instance, in the case of a single-service company cannot be capitalized for purposes of deduction from an assessment, while a deficit in one service of a joint-service company can be deducted from the profits in another service and the remaining earnings capitalized at full weight—the deficit in the one service to that extent providing exemption for the other service.

An actual deficit in earnings in the sense employed by the Tax Commission (earnings before payment of interest and charges) could hardly occur, but the point holds none the less that by combining the low earnings of one service with the earnings of a more profitable service and capitalizing the whole, the small returns in the one service provide a more effective exemption than could be accorded the same earnings of a single-service company. In 1921, for example, which was a year of low earnings, the single-service electric light and power companies paid in taxes 21.1% of their gross incomes (corresponding most nearly to the earnings capitalized by the Tax Commission); single-service railways paid 30.1%; but the combined-service companies, instead of paying an average rate somewhere be-

TABLE XXVII. TAXATION OF ELECTRIC RAILWAY COMPANIES IN WISCONSIN
All Companies Having Electric Railway Service, as Companies, without Apportionment among the Various Services
Condensed Income Account

Item	1920*	1921	1922	1923
Gross Receipts	$32,286,444.59	$32,187,859.65	$31,125,230.92	$38,450,696.61
Operating Revenue	31,722,556.31	31,705,132.84	30,793,931.75	37,952,239.22
Operating Expenses	25,360,682.02	23,243,374.76	22,322,059.70	26,608,718.66
Net Operating Revenue	6,361,874.29	8,461,758.08	8,471,872.05	11,343,520.56
Non-Operating Income†	563,888.28	482,726.81	331,299.17	498,457.39
Gross Income	6,925,762.57	8,944,484.89	8,803,171.22	11,841,977.95
Interest, Rentals, and Other Deductions	4,066,690.73	4,924,315.44	4,803,002.70	5,176,536.69
Net Income before Taxes	2,859,071.84	4,020,169.45	4,000,168.52	6,665,441.26
Taxes	1,609,207.33	1,741,905.25	2,018,818.96	2,816,173.26
State and Local	1,351,930.33	1,560,518.20	1,849,910.32	2,171,140.14
Federal	257,277.00	181,387.05	168,908.64	645,033.12
Corporate Net Income	1,249,864.51	2,278,264.20	1,981,349.56	3,849,268.00
Total Expenses	31,036,580.08	29,909,595.45	29,143,881.36	34,601,428.61

*One company, with operating revenue of $3,870.13, omitted in 1920 on account of incomplete data.
†Includes both "Utility Non-Operating Income," and "Corporate Non-Operating Income," for 1920-1922, inclusive.

tween 21% and 30%, paid a rate lower than either, namely 18.5%[27]—suggesting certainly, though it does not prove, the extent to which the low earnings of the one service tempered the assessment of the other. Even poor relations may be welcome if they provide sufficient tax exemption.

4. The fourth factor is apportionment of a disproportionate share of interest, charges, and perhaps of federal taxes to the railway service of joint companies. This seems to be suggested by Table XXVI, where interest and charges of single-service electric light and power companies (as would be expected from the nature of the industry) represent a much larger proportion of all expenses than in the case of single-service electric railways.[28] But the fixed charges of the light and power service of joint-service companies are only 16½% greater than those of the electric railway service of the same companies.[29]

This does not mean necessarily an intentional overloading of the railway service. Interest charges are often the results of a long and complex financial history more than of present properties or revenue; and in the apportionment of joint property accounts, corporate overhead and general expenses, property and miscellaneous taxes, one can rarely be positive. With ad valorem taxes, for instance, in order to have a statistical exhibit that would correspond exactly to the original assessment, the apportionment would have to be based upon exactly the same composite averages and with the same weights and "considerations" as those employed by the commission in making the original assessment. These are largely "unknown and unknowable," as Judge Savage said in the Portland Water Works case, and are not necessarily the same for any two assessments anyhow.

All this is no reflection on the various parties concerned. The Tax Commission is primarily concerned with securing an equitable assessment of the companies as units, in comparison with other taxpayers, not with a hypothetical, piecemeal allocation of assessments among the various elements involved;

[27] Ratio of total taxes paid by both electric railway and light and power services of joint-service companies to total gross income of both services of the same companies. (Tables XVII and XXIII.)

[28] In the ratio of 19.38 to 13.08.

[29] Ratio of 17.0 to 14.59.

TABLE XXVIII. TAXATION OF ELECTRIC RAILWAY COMPANIES IN WISCONSIN

All Companies Having Electric Railway Service, as Companies, without Apportionment among the Various Services

Ratio of Total Taxes to Designated Items Expressed as a Percentage

Item	1920	1921	1922	1923	Three-Year Average* (1920-1922)
Gross Receipts	4.98	5.41	6.49	7.32	5.62
Operating Revenue	5.07	5.49	6.56	7.42	5.70
Net Operating Revenue	25.29	20.59	23.83	24.83	23.05
Interest, Rentals, and Other Deductions	23.24	19.47	22.93	23.78	21.76
Net Income before Taxes	56.28	43.33	50.47	42.25	49.36
Corporate Net Income	128.75	76.46	101.89	73.16	97.47
Total Expenses	5.18	5.82	6.93	8.14	5.96

*See footnote to Table XIV.

in fact, the whole theory of ad valorem assessment involves getting away from that kind of assessment; and the companies in turn are more concerned with the payment of taxes than with the statistical problems to which they give rise. But it does indicate the caution with which tax statistics of particular industries must be interpreted, where these statistics depend upon any element of apportionment among services; and this applies to all of the local public utility industries.

For this reason we conclude our present discussion with an exhibit (Tables XXVII and XXVIII) of the taxes paid by all electric railway companies in Wisconsin, *as companies,* and without any apportionment among the various services that may be provided by the same companies. We are able here to give the 1923 data—for whatever encouragement it may afford.

The tax burden here is not nearly so extreme as that indicated by the Census or our own figures for *electric railway service* in Wisconsin. Yet these companies, stripped of all statistical problems of apportionment or of assessment method, for three years "broke even" with the government on all income after expenses and charges—to be exact, paid to the government $49.36 out of every $100 remaining after expenses and charges.

In 1922 they paid $50.47 out of every $100 of net income before taxes, which compares with the corresponding Census figures of $53.19 for electric railways throughout the United States. But the Census figures for electric railways in Wisconsin in 1922, even including "auxiliary revenue," is 69.1% of net income before taxes (taxes $1,017,697, net income before taxes $1,472,559). If we might assume, therefore, that the Census figures for "electric railways" in the United States exceed the figure that would be found for electric railway "companies" *by the same amount that the Census figures for "railways" in Wisconsin exceed the actual figures for railway "companies" in that state,* then the tax ratio for railway companies throughout the United States should be around 39% in 1922, compared with our figures, 50.47% for Wisconsin.[30] This would seem to suggest a conjecture that electric railway "companies" either are somewhat less heavily taxed outside of Wisconsin or are for other reasons able to secure a larger net income out of which to pay taxes, though any positive inference to that effect will of necessity have to await the compilation of much more exact information.

But a comparison of tax levels in different states is, after all, of minor importance, since there is no reason why 48 states, under varying conditions, with varying scope of public service and varying policies with respect to taxes and credit financing, should show or be expected to show a uniform level of taxation. Of more importance is a comparison of the Census figures, $53.19 for electric railways in the United States, with taxes paid by other industries and groups of taxpayers in the United States, and of our $49.36 for electric railway "companies" in Wisconsin, with the taxes paid by public service industries in general, business corporations, and other groups of taxpayers in Wisconsin. It is this comparison that indicates equality or the absence of it, and on this problem we shall hope to bring some further facts to bear.

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[30] Ratio of 69.1 to 50.47 = ratio 53.19 to X.

PLACE OF TENANCY IN A SYSTEM OF FARM LAND TENURE

By GEORGE S. WEHRWEIN

IN a recent number of the *Christian Century* there appeared an editorial on "Returning the Soil to the People." In part this editorial reads: "Once the people regain the natural right to the soil which God gave them there is a foundation for national prosperity, internal peace and social progress. Lenin put the peasants of Russia into possession of the land and kept them at peace while he ruled through a dictatorship. . . . The French revolution was due more to landlordism than to any one other aspect of monarchical tyranny. The small new self-governing peoples in Europe are building a solid national economy by restoring the land to the people."

Speaking of Latvia, where for generations the peasantry had been under German, Russian, and Polish landlords, the writer says: "Since obtaining independence they have expropriated the landlords, put all waste, mineral, and forest lands under the control of the state, set apart places of historic and natural beauty as national parks, secured all water rights for the people, and divided the arable lands up into small, privately owned farms with all possible provision for making them the permanent homes of the operators. Such a policy is the greatest security possible against communism. No agricultural land can be democratized under landlordism, with 'the people aliens in the land of their birth.' No more menacing drift is on in America than that toward tenantry." [1]

This editorial expresses a common view on the subject of farm tenancy. Since 1880, when the census first revealed to us the proportion of tenants, the percentage of tenancy has increased from about 25 to over 38 in 1920. This steady increase has alarmed many students of the land question. Somehow we feel that tenancy is unnatural and un-American. It is difficult for us to believe that it could develop in America, where our land policy has been such as to make land practically free and available to everybody. Congress has changed the method of disposing of our public domain many times but always in the direction of making it easier for the prospective farmer to get land. The ideal was not always attained, but the very title of the later acts, the "homestead laws," indicates the intention of the government to give a farm to everybody who applied for it and who was willing to do at least the minimum required of him in gratitude to the Republic. The reclamation policy was justified in the hope that it would produce thousands of home-owner farms.

With such a land policy it is difficult to understand why any one should be obliged to *rent* a farm. However, free land has practically been exhausted; in fact, land of real agricultural value suitable for a farm of 160 acres was gone about 1900. But land was valued long before free land disappeared and there was some tenancy from the very beginning of our national history.[2] But land

[1] *The Christian Century*, October 2, 1924, p. 1259.

[2] Taylor, H. C. *Agricultural Economics*, Chap. XX.

values have risen rapidly, especially since 1900, and the percentage of tenancy rose to 28.4% in 1890 and made its greatest jump in the next decade. In 1900 over 35 out of every hundred farmers were tenants and in 1910 the proportion increased to 37.

With the change in economic conditions there has come a change in the method of acquiring farms. Landed property now has high value and it has to be acquired like any other income-producing piece of property; it has to be paid for. The method of acquiring full ownership of land helps to explain our system of farm tenure; when this is considered, it will be seen that "tenancy" is merely a part of the larger problem of tenure in general.

Those who condemn tenancy without qualification often read into our situation the landlordism and feudal tenures of European countries. As a matter of fact our system of land tenure has had a very different development. Furthermore, it is by no means uniform in its characteristics over such a large country as the United States. With the exception of New York, every state north of the Carolinas and east of Ohio had a lower percentage of tenancy in 1920 than in 1880. In the Cotton and Corn Belts there has been a general increase, although during the last decade there are many individual counties and even several southern states which decreased their proportion of tenants. The greatest increase during the last census period came in the Great Plains states north of Oklahoma.

Certain crops and types of agriculture seem to be peculiarly adapted to tenant farming. Cotton is the most notable example; in fact, the cotton area contains one-half of the tenant farmers of the United States. Tobacco and rice are found in the same general region and are also good tenant crops. In the North, corn and wheat are the main crops raised by tenants. In the most of Iowa, north central Illinois, eastern South Dakota, eastern Nebraska, and central Kansas, tenant farmers are nearly one-half of the total number of farmers. On the other hand, dairy, live stock, fruit, and truck farms are usually operated by the owners, although there are some exceptions.[3]

The Human Element in Farm Tenancy

However, the greatest factor in the tenure situation is the human element. The South has not only cotton, tobacco, and rice but also the negro and a special type of white tenants. This combination explains why in some of the southern states over two-thirds of the farmers are tenants. The tenure situation in this part of America cannot be understood without a survey of its historical development. With the close of the war between the states came the end of the old plantation system based on slave labor. The largest part of the property values of the South was destroyed when property in slaves was abolished. Land was cheap; in fact, it was almost valueless as a basis for credit during reconstruction days. To a large extent capital was wiped out by the war. The freedmen, unused to a money economy, illiterate and peculiarly conscious of their freedom, had to be adjusted to the new situation. The planter had to adapt his whole system of agriculture to the new conditions. By trial and error the present system of land tenure was evolved. At first the planter tried to hire the freedmen at cash wages, but this would not work. Under this plan

[3] Gray, L. C. *et al.* "Farm Ownership and Tenancy." *Yearbook of the United States Department of Agriculture, 1923*, p. 515.

he was not sure of his labor supply, because the negro was not inclined to work as long as he had money. So the present "cropper" system had its origin. Large plantations are divided into proper-sized units, each unit in the hands of a "cropper." The landlord furnishes all the equipment, work-stock, the land, and often helps the tenant to secure credit at some store or bank which will "run him" until his "crop is made." Naturally such "croppers" are supervised in their work; in fact they are really *laborers* paid in kind—usually one-half of the crop. Under such a plan the "cropper" has an interest in the outcome of his work and will stay on the farm till the crop is harvested to get his share of the reward.

The census did not distinguish "croppers" from other tenants until 1920. Then it was found that nearly 23% of all those classed as tenants were in fact "croppers" and not of the same economic status as the others. In Georgia there is a court decision which makes a careful legal distinction between the two. Because of this confusion the South is credited with tenants who in other parts of the country correspond to laborers. Over 47% of all the negro tenants of the South were "croppers" in 1920.

This also throws light on another problem. For the last 40 years there has been a steady increase in the number of farms in most of the southern states. But in only three states was new land brought under the plow; in fact, most of the states had a decline in farm acreage from 1910 to 1920. Naturally there was a proportionate decrease in the size of farms. There was a general belief that the large plantations were breaking up, whereas there was but little change in the plantation system. Since every tract operated by a "cropper" was called a "farm" in the census enumeration the increase in "farms" and "croppers" merely meant more fields being cultivated by this type of tenants. A special study of the plantation system made in 1910 showed that there was very little disintegration of the plantations into small farms sold or leased to independent farmers.

Other types of renting were also evolved, most of them of a higher order. One of these was the "third and fourth," that is, the landlord receives one-third of the grain and one-fourth of the cotton. Under this plan the tenant furnishes most, if not all, of the equipment and enjoys greater freedom of management. Other forms of renting are the usual cash rent and the "standing rent." In the latter case the tenant agrees to furnish a definite amount of the crop (say one-fourth bale of cotton per acre) irrespective of yields or prices. However, there are many combinations (such as "share-cash") depending on the kinds of crops and localities. In some places the landlord supervises his tenants as well as the "croppers," and the difference between the two groups is by no means a clear one. In some localities other fractions than the third and fourth have become customary.

Looking at the tenure situation from the negroes' standpoint there is reason for rejoicing. In 1920 there were about 925,000 negro farmers in the United States; almost 25% of these had acquired the ownership of a farm. In Virginia there are almost twice as many farms operated by negro owners as by negro tenants, and in Florida the numbers are about equal. In the northern states about three-fourths of the negroes own the farms that they operate, but, of course, the total number is small. Remembering that in 1865 the negro had to start with absolutely nothing in

the form of property or other resources, this relatively high percentage of ownership is an excellent proof of the progress of this race in land tenure.[4]

Among the Chinese and the Japanese farmers living in America the percentage of tenancy is 84.4 and 87.8 respectively. The explanation of this is found in the fact that the laws of most of the far-western states prohibit the ownership of land by the Oriental or even the leasing of it for a long period. Although the total number of Oriental farmers is not large, the fact that they are forced into the tenant class helps to increase the proportion of tenants in such states as California, for example. Among the Indian farmers only about 17% are renters, largely because of the legal restrictions put around them.[5]

Tenancy among the white farmers is by no means uniform. In 1920 over 25% of the white tenants of the South were found to be "croppers" and therefore in the lowest tenure class. Many of them will not rise much above this stage. Again there is an historical reason for the situation. Before the Civil War the white people of the South generally fell into two large classes, the slaveholders and non-slaveholders. Of the 118,000 families in Georgia in 1860, 77,000 held no slaves but were engaged principally in agriculture. The mountain and Piedmont people hardly ever came in contact with slavery. Thousands of others who were called "the poor white trash" drifted into barren and waste places. Many of the present tenants are descended from these people who after the war lived through the reconstruction times with the negro as a competitor for land and wages.[6]

It must not be inferred that all the white tenants of the South are in this class. In the newer parts of the South there are fewer "croppers." In Texas and Oklahoma the white tenants exceed the colored by about 100,000 and the tenant problem there is a white man's problem. It is in this region that the "Renters' Union" and other agrarian movements had the greatest vogue.

Another classification of white farmers made by the census is that of native-born and foreign-born. Of the former about one-third were tenants in 1920, of the latter a little less than 19%. The foreign-born farmer brings with him a hunger for land that stimulates him to become an owner. It is also notable that those sections where the descendants of foreign-born are now farming are usually regions of low farm tenancy. A reclassification by countries reveals some interesting variations. For instance, out of the 15,000 Finnish farmers only 8% are tenants; of the 140,000 German farmers, 16%; and of the 12,000 or so Mexicans almost 86% are renters.[7] In fact, land tenure among the Mexicans is so peculiar as to require separate study. But perhaps enough has been said to emphasize the statement that American farm tenure conditions are extremely varied.

Tenancy as a Stepping-Stone to Ownership

The fact that men must become farm owners by gradual steps accounts for at least four types of tenure: (1) The farm laborer who works for wages and has little capital or property. Logically the southern "croppers" fall in this

[4] Gray, L. C., *et. al. Op. cit.*, p. 518.

[5] *Census Monograph IV*, "Farm Tenancy in the United States, 1920," Washington, D. C., p. 72.

[6] Brooks, R. P. "The Agrarian Revolution in Georgia," *Bulletin of the University of Wisconsin* No. 639 (1914) pp. 76-85.

[7] *Census Monograph IV*, "Farm Tenancy in the United States, 1920," p. 77.

group. (2) The "real" tenant who owns most or all of the equipment and the work animals required to operate a farm. Where live-stock farming is practiced he may share the ownership of the dairy cows, hogs, poultry, and other animals with his landlord. (3) The mortgaged owner. (4) The debt-free owner-operator. The census makes another division, namely, the farm manager. A little over 1% of the number of farms, but almost 6% of the total farm area of the United States, is subject to this kind of tenure. Owner-operators are also divided into those who rent land in addition to the area they own and those who farm owned land only. From the standpoint of the present discussion only the first four will be considered.

Few farmers are born with farms and still fewer have farms thrust upon them. Fully 80% of the present farm-owners had to buy their farms, and the purchase of a farm represents a good deal of capital. The average farm of the United States represents an investment of about $12,000. The value ranges from about $3,000 in some of the southern states to $40,000 for the average Iowa farm.

The purchase of a farm has certain peculiar features that should be noted. In the first place, the farm and the home are inseparable. In the city a man may own a home and rent his place of business, or vice versa. Very often he rents both. Many of the phases of urban tenancy are therefore different from rural tenancy. Secondly, the farm must be purchased as a unit; it cannot be purchased acre by acre and be of any use as a productive piece of property. In fact, land does not come on the market that way. Likewise, equipment, buildings, and work animals must be purchased in sufficient quantities to provide a proper proportioning of the land, labor, and capital factors. The whole represents a "going concern."

If a young farmer could come into possession of $40,000 at once the purchase of an Iowa farm would be easy. But in the majority of cases he has to *earn* this money in whole or in part before he can become an owner of such a farm. It has been suggested that the farmer ought to be able to pay for the farm out of the profits of agriculture. In other words, he ought to be able to borrow this sum, pay cash for the land, and then repay the principal and interest out of the farm income. This may be possible in exceptional cases, but in the majority of cases there must be an accumulation of some capital for a "down payment." In this respect the purchase of a farm is no different from the purchase of any other business. The Federal Farm Loan Bank, especially designed to give the farmer long-time credit, requires an accumulation of capital of at least 50% of the value of the land and 20% of the value of the buildings, unless the prospective purchaser has additional sources of credit. The same principle is observed in the California State Land settlements. A considerable accumulation of money is considered necessary before a farm is sold to the farmer.

The methods used to earn the purchase price or the "down payment" on a farm are uniform enough to admit of classification, and, as has been said before, are chiefly responsible for our system of land tenure. So many farmers have started in life as hired men, then rented farms, bought land, emerging finally as debt-free owners that the process has been called the "agricultural ladder." Inheritance, gift, marriage, and homesteading account for the ownership of probably less than 20% of the

farms and of less than that percentage of debt-free farms. Not all farmers go through all the steps indicated here; some skip the hired-man stage or the tenancy stage altogether. The Census of 1920 obtained the history of over 3,500,000 farm owners. Numerous local studies have thrown additional light on this movement to ownership, and have made it clear that there are many variations from the simple formula of hired man—tenant—mortgaged owner—owner. Sometimes the young farmers receive wages while still at home; in a surprising number of cases they have earned considerable sums of money as laborers in non-agricultural occupations. Not all the young men who leave the farms are permanently lost to agriculture.

The Census of 1920 shows that out of every 100 men who owned farms at that time at least 35 had worked on farms for wages. During this period they accumulated some capital but also experience. Even if they were born on a farm, they learned new methods from their employers.

After the farm laborer has acquired some capital, he is in a position to buy the equipment necessary to run a farm, and proceeds to rent. Probably he has also reached the time in life when he wishes to marry; in that event he can have a home on a rented farm, whereas this is not the usual thing if he is a wage-earner.

The tenant stage is generally one of rapid capital accumulation. The tenant now is able to use not only labor but capital on an area of land suited to his capacity as a manager. As his ability grows and his equipment becomes greater he often finds it advisable to move to a larger or better farm. Much of the moving of tenants so much complained of is due to this very legitimate reason. In a community where renting of land is general, such adjustments of man to the land are easily made.

The tenant stage, like the hired-man stage, is a period of apprenticeship. In many cases the tenant is related to his landlord, and renting is a partnership between the two. In almost all share renting, and especially stock-share leasing and "cropper" tenancy, the landlord's rent depends directly upon the outcome of the crop. He therefore keeps control over the operations of the farm. The inexperienced tenant finds this supervision and advice useful, although in some cases it may take the form of exploitation. In some types of farming the apprenticeship of tenancy is much less important than in others, especially in the one-crop areas.

Tenancy was a stage in the experience of at least 44% of the farmers who are now owners, according to the Census of 1920. In the West North Central states over half of the farmers had at one time been tenants and in the West South Central states almost 60% had rented land. In the Mountain and Pacific states the percentage of tenancy is under 20; yet about 35% of the present owners had at some time been tenants. Undoubtedly most of these men had gained their experience in the eastern states and became owners through homesteading or purchase in the West.

The relation of the number of men who use tenancy as a step in the movement toward ownership and the percentage of tenancy is ground for speculation. Omitting those who never leave the tenant stage at all (the permanent tenants), the number of farmers classed as tenants at a particular time will depend upon the number of farmers who use this method of accumulating wealth.

If 100% instead of 44% of the farmers include this step in their movement to ownership, the percentage of tenants will be increased. On the other hand, if the tenant period is lengthened without a change in the number of tenants, the same result will be obtained.

The next step is usually that of mortgaged owner. This stage deserves more study than has been given to it. While the census enumerator may classify a man on this rung of the agricultural ladder as an owner, the change from tenancy may not indicate progress. Studies in land values indicate that in the Corn Belt cash rents averaged about 3% of the valuation of real estate in 1920. In other words, the tenant paid a rent equal to but 3% of the value of the land. When such land is purchased, he is obliged to pay the mortgage rate of 5%, 6% or even a higher percentage. It is a case of "from the frying pan into the fire" for many inexperienced or inefficient farmers. Of the farmers of Travis County, Texas, it was said: "Many whites and negroes classed as home-owners have merely bargained for high-priced land which they will never possess free of mortgage. In fact, hard as the way of the renter is, the lot in life for many of those who know nothing but the one-crop system would be easier if they were renting. The interest, the taxes, and the upkeep on the land they desire to possess are costing them more per acre than the rent on the same land would be." [8]

The fact that land can be rented on terms less than the mortgage rate of interest has induced some farmers to remain tenants. Of course, they may have other reasons also. Such farmers may even buy a farm, usually in some place where land values are lower, and become landlords.

From the purely financial standpoint it may be questionable whether it is wise to buy a farm when they can be rented so easily and reasonably. The city renter argues the same way about the purchase or rent of a home. Nevertheless, there is a very strong preference for ownership among our farmers and especially the foreign-born farmers, many of whom come to America late in life and still achieve ownership. The uncertainty of tenure, the difficulty of proper relations with a landlord, the lack of interest in the farm and community, and the feeling that there is a time for final settling down urges men toward ownership. As long as land is constantly going up in value, there is another incentive. The tenant cannot share in this "increment," whereas the owner can. Therefore, men are willing to assume the risks of ownership to make the "speculative" gain that goes with rising land values. Still another reason is that a tenant at some time may reach the stage where he can no longer spread his capital over land and make a profit. For instance, $5,000 worth of equipment may be the proper amount for an 80-acre farm, and the 80-acre farm the proper-sized farm for this particular region and this farmer. Should he have laid aside $10,000, he might be able to equip a 200-acre farm, but this would be uneconomical from his standpoint. Farm management surveys show that the capital accumulation of tenants tends to approach a certain limit at which they become landowners, generally on farms smaller than they have rented during the last stages of their renting career.

Another interesting fact to be found in the last census is that 11% of the tenants of the United States had once

[8] Davis, E. E. "A Study of Rural Schools in Travis County, Texas," *University of Texas Bulletin*, 1916: 67, p. 7.

been owner-farmers. In some states the proportion is as high as one-third. There are two explanations for this situation. Many farmers sold their farms to become tenants, probably temporarily, in some new state. The fact that in most of the western states from 20% to 40% of the farm tenants once operated as owners suggests this. On the other hand, a large number of farmers have failed to hold their farms through misfortune or inefficiency.

In the South the climbers toward ownership very often do not go beyond the tenant stage. Under the semi-compulsion and supervision of the landlord the "cropper" accumulates enough capital to buy a mule and the few simple tools needed in cotton culture. He then rents on a tenant basis and becomes his "own boss." However, he soon goes into debt and in a few years loses his property and begins all over again.[9]

The tenants of the United States may therefore be classified as follows:[10]

1. Persons classed as tenants for statistical purposes, but who from the legal and economic point of view ought to be classed as laborers—the "croppers."

2. A large class who use tenancy as a step toward ownership.

3. A comparatively small group who failed to become owners and who reverted to tenancy. Some of these will "make the grade" in the future; others will become permanent tenants.

4. Another small group who prefer to remain tenants although financially able to purchase farms. These will be found in the class of permanent tenants subject to their own will.

5. "A large group of farmers, including probably the majority of the 'croppers,' who may never rise to ownership largely because of personal limitations, such as lack of adequate education and training, thriftlessness, inertia, instability, and unwillingness to assume risks."[11]

The Real Problem of Tenancy

The real "tenant problem" lies not with the men who successfully climb the ladder. Tenancy to them is merely a step to ownership and a very efficient part of the journey. The problem lies with the permanent tenant class—those who fail to reach the goal, who never try, or who, having tried to become owners, revert to tenancy, discouraged and ambitionless. These are the men who touch the hearts of those who consider the human relations involved in tenant agriculture.[12] However, cause and effect must not be confused. These people are not illiterate, inert, thriftless, or shiftless because they are tenants, but they remain tenants because they lack those qualities which enable men to succeed. A change in land tenure will not remove the difficulty. Were the "croppers" of the South given a farm gratis the chances are that the majority would be "croppers" again in a few years. They simply are not ready for the management of landed property. This condition is not peculiar to agriculture; there are persons who correspond to "croppers" in all walks of life, who lack the qualities necessary for successful management of property.

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[9] Brooks, R. P. "Agrarian Revolution" *Op. cit.*, pp. 60-62. Dixon, H. M. "An Economic Study of Farming in Sumter County, Georgia," *United States Department of Agriculture Bulletin*, No. 492, p. 12.

[10] Gray, L. C., *et al. Op. cit.*, p. 568.

[11] Gray, L. C., *et al. Op. cit.*, p. 568.

[12] See, for instance, the story by Ruth Sukow, "The Renters," in the *Century Magazine*, August, 1923, or the poem, "The Cropper Speaks," by E. E. Miller, published in the *Nation*, reprinted in the *Literary Digest* of March 4, 1922.

However, there is another phase of the matter that must not be overlooked. The weak and illiterate tenant, especially one of the colored races, is no match for his landlord or his credit merchant. There is *opportunity* for exploitation which the landlord, banker and merchant can take or leave as they choose. If they take it they are helping to keep their tenants in the permanent tenant class, and there is ample evidence that such conditions exist. Where generation after generation has failed to rise to ownership, the desire to own land and to settle down to become a resident of a community is not created in the minds of the children. The covered wagon with its load of children and chattels followed by a few farm animals becomes the real home of these people.

The remedy lies in forces far more fundamental than a simple change in tenure. A blanket abolition of tenancy will avail nothing. It would not make farm-owners of tenants; it would simply force them back into the farm labor class, and very many would stay there permanently just as they now stay in the "cropper" or tenant stage. A very helpful step toward ownership would thereby be denied them.

The Landlord in a System of Tenancy

Renting implies two parties to the contract—the tenant who wishes to use a piece of land for a limited period, and an owner who is willing to let his property for this time. There are regions where there is no land for rent although there may be people glad to rent it. Naturally the percentage of tenancy in such places is low. This is said to be the condition in Denmark, and it is considered an undesirable one in so far as it does not give young farmers an opportunity to use tenancy as a step toward ownership or an apprenticeship period.

In the United States there is always considerable land on the rental market. In the West are large areas of federal, state, and railroad lands which are leased usually for grazing purposes, but the largest part of the leased area is privately owned. Some of this is rented temporarily because the owner cannot operate it himself or he has too much land and lets a part to a neighbor. This accounts for much of the "rented-additional" land operated by part-owners. Almost 600,000 farmers of the United States operate rented land in addition to their owned farms. Some land is on the rental market during the settlement of an estate or while it is awaiting sale. Most of the land of the North that is being rented is owned by retired farmers who are gradually "retreating" from full ownership to complete retirement. Very often such a farm is rented to a son, son-in-law, or other relative. In a recent study involving 57,000 tenants from all parts of the country, it was found that 23% were related to their landlords. The percentage ranged from 12% in nine southern states to 36% in the North Central states.[18]

In addition to the farms that are rented in the interim between two ownerships there are some which are permanently operated by tenants. Some of these are owned by bankers or merchants but probably most of them are of the type of the plantations of the South or of the Scully estates of Illinois.

The function of the landlord in a system of farm tenure has received very little attention. It is unfortunate that we have no word that gives the American connotation of that term. To most

[18] Gray, L. C., *et al. Op. cit.*, pp. 527-528.

people it brings to mind the European or feudal meaning of the word which does not fit New World conditions in probably 95% of the cases. The "lords" owning American farms operated with tenants are certainly very few!

A popular conception of a landlord is a man who merely draws rent for which he makes no compensation to society or gives any help to his tenant. Such a theory leaves out of consideration all costs in connection with land ownership, costs which often overshadow the income. Except in cases of the purest type of commercial cash rent, the landlord performs a great many functions other than mere ownership. He always has to bear a part of the risk of agriculture even in cash and standing rents. If the tenant has no adequate harvest, it is often difficult to collect anything at all. In share-renting he definitely assumes part of the risk, and therefore supervises and superintends to some degree the farming operations. In many cases he not only furnishes land and the usual improvements but also the work-stock and other equipment. Speaking in economic terms, he is entitled to a return on this capital in addition to the land rent. As manager and supervisor he furnishes direction and labor, and in the case of the "cropper" he is called upon to furnish credit or to "stand for" his tenant with some merchant. For these various services he is usually rewarded by higher rents, rents which correspond to the increase in services and risks which the landlord assumes. The perplexities and difficulties of dealing with the large group of illiterate and irresponsible tenants must not be forgotten.

A part of any good tenure system involving tenancy is good landlordism. Much has been said about absentee landlordism and the undesirable features of such a condition. Here again we are likely to think in terms of European experiences. But the Census of 1900 reported that about 78% of the landlords lived in the same county in which their rented farm was located. A special study of 275,000 farms made in 1920 showed that 80% of the landlords lived in the same county, 11% in adjoining counties, and 9% in more remote districts. In the North and West the proportion of landlords remote from their leased farms was greater than in the South.[14]

Nevertheless, distance is not a real test of "absenteeism." A landlord may live in the next town and still treat his farm and tenant as if they were 100 miles away. The real test is his interest in his tenant, and this can hardly be measured statistically.

It is possible, however, to gage such interest in a measure by the residence and occupation of landlords. A study made by the Division of Land Economics of the United States Department of Agriculture based on returns from 23,000 landlords indicates that only 36% of the landlords of the North and 30% of those in the South were engaged in non-agricultural occupations. The same report says that 37% of the northern and 67% of the southern landlords are actually residing on farms while renting land.[15] The large number in the South is due to the plantation type of agriculture. As far as these figures mean anything, we must conclude that the actual farmer, the retired farmer or the landlord related to his tenant are in a position to be good landlords whose help and sympathy ought to be of benefit to their tenants. How-

[14] Gray, L. C., *et. al. Op. cit.*, pp. 533-534.
[15] *Ibid.*, pp. 533-535.

ever, the banker or merchant landlord, if he wishes, may have just as great an influence for good as the farmer landowner.

Another current idea is that the growth of tenancy naturally implies a concentration of lands in the hands of a few people. The plantation system of the South presents a picture of large landholdings but these go back to the post-bellum days and are not a development of the present tenant-cropper régime. A comparison of the Census of 1900 with a study of 275,000 farms in 1920 does not indicate any great change in the 20 years. About one-half of the farms were owned by landlords having but one farm. In 1900, 22% of the landlords had more than five farms; in 1920, 25%. Most of the landlords with more than five farms are in the South where "cropper" fields are classed as farms. However, tenancy, like the tariff, is a local issue. One must not conclude that just because the general picture is good there are no flaws in the details. Dr. Gray concludes that "there is enough both of absenteeism and concentration of ownership to justify real concern." [16]

Tenancy has been criticized by sociologists because it is accompanied by an unstable rural life, exploitation of the soil and the tenant, and poor rural organizations and institutions. However, much of this is due to the instability of American life in general. Even home-owner communities are constantly in a flux. The experience of England proves that good agriculture and a wholesome rural life are entirely possible even with a high degree of tenant farming.

[16] Gray, L. C., *et. al. Op. cit.*, p. 538.

[17] *Census Monograph IV*, "Farm Tenancy in the United States, 1920," p. 26.

[18] Gray, L. C., *et. al. Op. cit.*, pp. 598-599.

Policies with Respect to Farm Land Tenancy

What shall be the American land policy with regard to tenancy? It is admitted that there might be too much tenancy, that we ought not to go beyond a "normal" percentage of tenant farming. Probably this percentage would be that amount of tenancy needed to provide the proper step toward ownership for the tenant and to bridge the gap for the retreating farmer between active work on his farm and complete retirement. However, these two things can be accomplished by other means. In parts of the United States, which are well-established sections of prosperous agriculture, there is little tenant farming. Canada decreased her proportion of tenants from 15.4% in 1881 to less than 8% in 1921.[17] Denmark's land policy has been directed towards a reduction of tenancy. A further extension of land credit has been suggested. It may be that these other means are not as efficient as tenancy. Further studies are needed to prove this.

In general our efforts are being directed towards earlier acquisition of farms. The Federal Farm Loan banks and state credit associations are such agencies. The state settlements of California owe their inception, at least in part, to the desire to reduce the amount of tenancy. Standardization of land titles, improved methods of valuation of land, and suitable taxation policies have also been suggested.[18]

Previously in this article it was suggested that the real tenant problem lies with those men who remain in the permanent tenant group. It may be that for some farmers tenancy is the goal; that is, they prosper when renting land under the guidance and supervision of

a landlord. Probably most of the "croppers" are in this class. In this respect they are like men in all other occupations; some there are who do very well as clerks but who fail as merchants. Nevertheless, the analogy does not hold for agriculture in all respects. Generally speaking, in the North at least, a man may be considered a failure who is not able to reach ownership. Perhaps exceptions might be made for misfortunes and unforeseen circumstances. Such a man might be better off if he quit farming and went into some other occupation. It is significant that in a study of the agricultural ladder in Wisconsin now being completed it was found that practically all the tenants had the firm ambition to become farm-owners.[19]

Since the presence of a permanent tenant class indicates inefficiency on the part of the farmer, the solution does not lie in changing their status but in removing their inefficiency. This must necessarily be a slow process, involving the best efforts of all the economic and social institutions involved. Meanwhile there must be *good* tenancy with proper rental contracts, right relations between landlord and tenant, and proper legal regulations, such as have been evolved in England, safeguarding the rights of tenant and landlord alike.

[19] Study by Guy A. Peterson soon to be published as a Wisconsin Experiment Station Bulletin.

THE PREVENTION OF ECONOMIC WASTE BY CITY PLANNING

By HARLAND BARTHOLOMEW

THE marvelous urban development witnessed in this country in recent years has produced serious economic problems. Almost all of these problems have their origin in the methods by which cities grow. As exemplified here, city growth is at once spectacular and amazingly wasteful. One billion dollars annually is the conservative estimate of property loss in American cities made by Mr. Walter Stabler, comptroller of the Metropolitan Life Insurance Company, probably the largest lender of money on real estate. And loss in real property values is but one form of economic waste in cities.

It is highly significant, moreover, that economic loss is most apparent where the greatest population increase takes place, namely, in the largest cities. New York is an outstanding example. Consider the paradox of the world's metropolis having the highest land values, the most burdensome taxes, and the greatest debt; the greatest subway system and the worst congestion; the largest urban population and decreasing home ownership, now decreased practically to the point of disappearance in Manhattan.

Need for City Planning

Such a paradox would not appear if cities were deliberately designed and could be made to grow along orderly, systematic, well-considered lines. That economic waste increases with the size of cities is merely indicative of the fact that our cities have all grown in too similar fashion. They have been poured in more or less the same sort of mold. Growth has been haphazard and hence inevitably wasteful.

Obviously, cities should not be alike. Differences in physical form and size as well as in the characteristics and activities of people demand variety in design. Cities should have individuality. The greatest economy and, incidentally, the greatest beauty will come where there is the nicest blending of form and function. This is city planning. This is the sort of guidance which American cities have quite generally lacked. The effects are now being felt. The fascination of huge urban growth has overshadowed the damages of its concomitant economic ills.

Spread of City Planning

In the announcement of May 10, 1922, for the Plan of New York and Environs, the following pertinent statement was made: "With a wisely conceived plan public funds which will be expended in any event can be directed into projects of a permanent constructive value; without a plan millions are likely to be wasted in desultory or ill-considered public works."

City planning, the science and art of properly directing city growth, has made its bow in American cities. For 15 years or more a group of men and women, engineers, architects, landscape architects, economists, and sociologists, largely through the National Confer-

ence on City Planning, have been studying and discussing the causes and effects of urban growth and measures for its proper direction and control. Much has been learned, and many cities are beginning to benefit through practical application of city-planning principles. But not until leaders of civic thought and captains of finance more fully appreciate the profound social and economic significance of the city plan will the roots of urban waste be finally reached.

Lack of Permanence in Urban Land Utilization

City planning recognizes urban growth as organic. There must be unity of design and function. A city is a growth—an organism. It is the result of an interaction of human forces. It cannot be created or bounded by governmental decree, as can a state or other political unit. To quote Elihu Root—"the force from which that growth comes is the force of individual enterprise, based on the desire for movement, the desire for a living, for wealth, for comfort, for society, all these desires existing in the hearts and acting on the minds of a vast number of units. That is the great force of life, of modern civilization, and that is the thing that government cannot imitate."

Cities have grown as the result of a "multitude of individual impulses." Since there has been little or no attempt to coordinate the varied activities resulting from these impulses, the modern city is an organism lacking unity. It is composed of a more or less disorderly and disorganized mass of conflicting elements. Cities today are the most uneconomical, inefficient, and usually the least attractive of man's works.

The wholesale shifting of neighborhoods, with consequent deterioration of property and depreciation of property values, is the result of undirected growth. The lack of a reasonable permanency in the character of districts has brought about a general instability of property values. Blighted areas result from the encroachment of enterprises of an undesirable or of a conflicting character. Entire residence districts have been deserted by all but the poorest class of tenants when invaded by scattered business and industrial establishments. The encroachment of industry and the lack of adequate means of circulation has caused the relocation of business districts in many cities. In a single block in New York City assessed valuations of property were reduced from $17,000,000 to $7,000,000 from 1911 to 1917, and this figure represents much less than the actual monetary loss. This is but a single specific instance of what happened over a large area in New York City and is repeating itself in most large cities.

The lack of permanency in districts is reflected in the lack of permanency in building construction in American cities. Absence of a city plan causes a lowered confidence among individual builders, who have unconsciously fallen into evil ways of cheap speculative building instead of permanent durable construction. The extravagant American custom of constantly building up and tearing down is an outstanding example of unnecessary waste. Loan companies in this country refuse to lend more than 50% on the value of property.

Remedies for Congestion

The public is only beginning to realize the many evils resulting from overintensive use of land. Chief among them is the problem of street conges-

tion, which daily causes staggering losses of time and injury to business, with consequent damages to property values. New York realized too late the folly of overconcentration of business and is now trying to stay the ever-increasing congestion by the limitation of building heights. The regulations adopted, however, have had little effect in reducing congestion, though they make possible more attractively designed buildings and often provide for better light and air conditions. The height permitted is still so great that there is practically no limitation upon congestion of people upon the land. New York has already spent $500,000,000 on subways and it is now proposed to expend $200,000,000 more for further construction. But congestion increases faster than the ability of the city to provide relief. No real solution of the problem lies in such measures.

A middle-western city with no really high buildings, and an average of four stories throughout the business district, has street congestion. For six years a height limit of 150 feet was enforced. Recently, however, due to the influence of one public utility company which wished to erect a building something over 300 feet in height, the limit was changed to 250 feet with greater heights possible by special permit. The building proposed is of the "setback" type of design, with floor space equivalent to an approximate 18-story cubical building occupying the same site. If a 12-story height limit compelled this company to secure one and one-half or two blocks of ground there would be an increase in the cost of the plant which might find reflection in a slight increase in the price of the commodity sold. If the higher building is permitted, others of similar height will be erected and the municipality will be faced, at least much sooner than would otherwise be the case, with enormous expenditures for the relief of street traffic congestion. It is very evident that the cost of the service provided by this company, even if increased by the greater cost of plant and site, would be much less than the cost of attempting to solve the traffic problem created by high buildings. The public must pay the bill in either case. Lack of enlightened public opinion and a stable, reasonable policy of directing growth, in this and other cities, results in mistakes and compromises that inevitably increase the ultimate public expense.

Scientific Street Planning

The enormous losses due to the poor street systems of unplanned cities are just becoming appreciated. The imperfect adaptation of streets to the requirements of modern traffic is one of the greatest contributing causes of street congestion, with its attendant economic losses. The evil effects of street congestion have become so obvious in many cities that huge sums have already been expended in efforts to remedy some of the defects of the street systems. Also ever-increasing sums are being spent for traffic regulation. Millions of dollars are required for the widening of inadequate streets and the opening of new streets in built-up business districts. Other millions are wasted on excess paving where roadway widths have not been determined scientifically. Roadway widths should be determined in relation to lines of traffic. In one mid-western city, the city engineer is still laying out 30- and 40-foot pavements when 26 and 36 feet would accommodate respectively three and four lines of vehicles equally well. In the last five years the excess pavement charge

against that city is estimated at no less than $125,000. Since the adoption of a scientific arrangement and development of major and minor streets in St. Louis in 1917 there has been an annual saving in pavement construction of $200,000.

In 1875 it was proposed to widen Grand Avenue in St. Louis from 80 to 120 feet. Grand Avenue was then the western city limit and had practically no buildings throughout its length of 8 miles. The estimated cost of $5,000 was considered prohibitive and the project abandoned. Today Grand Avenue is St. Louis' busiest crosstown street. It is so crowded with traffic that relief is imperative. It cannot now be widened for less than $5,000,000. Alternative plans for widening and opening adjacent parallel streets, now proposed, will cost from $1,500,000 to $2,000,000.

The rerouting of a transit line upon a newly opened street in St. Louis has reduced the traveling time from 10 to 15 minutes each way of several thousand people daily. By a more carefully planned street arrangement and transit rerouting it is estimated that an additional area equal to 21% of the total area of the city of St. Louis can be brought within a 30-minute (riding) time zone, an improvement which will discourage overcrowding at the center and postpone the time when rapid transit or other expensive measures to relieve congestion must be undertaken.

Planning Subdivisions

There has also been waste of land area by improper platting of subdivisions. This has resulted from standardized methods of platting. Neither the size nor shape of lots or blocks has been carefully determined with reference to their probable use or to the requirements of topography. A uniform checkerboard arrangement is the customary rule. Streets have been spaced as closely in residential neighborhoods as in business districts; whereas blocks in the former might well be two or three times as long as in the latter. In industrial districts, too, unnecessary streets have often been provided. Here the wastefulness of space may actually interfere with the activities of the district. Likewise, because of standardization, there has been waste in the excess widths of streets which serve only local needs.

Developing Land for Special Uses

Losses have also resulted from inappropriate development of areas preeminently suited for particular or specialized use. Low-lying land which might well serve industrial needs has too often been subdivided for residential purposes. Either the area remains undeveloped, or the character of the development is such that an inefficient use has been made of the land. And conversely, an even greater wastefulness results from the placing of industries in areas most suitable for residential development. Often land which is too rugged for economical use as residential property might easily be developed into picturesque parks, which would enhance the value of all surrounding property. Failure to take advantage of all such opportunities for creating monetary and aesthetic values is inexcusable. In New York City the land for Central Park was acquired in 1858 and development started. During the following 15 years there was an increase of 800% in values of property around the park while the increase in other parts of the city was only 100%. Not

all of this increase was due to the park. Most of the surrounding land was in an undeveloped state at the time the park was acquired and the increase in value is naturally greatest at the time development begins. But the park did hasten development and increased the desirability of surrounding land to such an extent that it is conservative to say that values were quadrupled as a direct result of the park.

The value of recreation in promoting the public well-being, and the responsibility of the municipality in providing adequate areas for such use, has been realized rather tardily by most cities. Consequently the cost of acquiring land for these purposes in built-up areas has often been tremendous. A saving of millions in municipal expenditures could have been effected had cities anticipated their needs in this direction, and purchased property before development took place. Municipal economy can be promoted by timely purchases of parks and areas naturally suited and strategically situated for recreational use. Playgrounds have been known practically to lose their usefulness through the encroachment of industries and the consequent crowding out of the resident population. There can be no safe investment in public properties of this sort without the assurance of stability found in a definite city plan.

Provision of Public Utilities

One of the most obvious examples of the waste of public funds appears in connection with the provision of public utilities. Unless growth can be directed, it is practically impossible to know at the time of installation what eventual requirements for these services will be. There is extravagance in providing for a more intensive development than actually takes place, and there is often colossal waste in replacing facilities which prove inadequate. In St. Louis the unforeseen concentration of large apartments on Pershing Avenue made necessary the enlargement and reconstruction of a comparatively new sewer in that district. The engineer in charge of sewer construction in St. Louis has estimated that $2,000,000 could have been saved out of the city's total investment of $20,000,000 in sewers had there been a zoning ordinance upon which sewer design could have been based with reasonable exactitude. Wastefulness at another extreme is the provision of public utilities for widely scattered residential development about the edges of cities. There would be a more reasonable development within established, centrally located residential areas, and less of the scattered type about the edges, if growth were directed in orderly fashion.

Regulation as a Remedy

The problems resulting from unsystematic city growth have produced endless regulations. Building codes and housing laws have curbed much poorer construction and to a certain degree limited congestion. Street congestion has brought about innumerable attempts at traffic control. Zoning regulations have been adopted in the hope of stabilizing property values.

Some relief, both temporary and permanent, has been afforded by such well-intentioned efforts, but the problems connected with city growth have constantly increased. Regulation is costly and too often merely palliative. The mounting administrative expense which too much regulation has caused

brings increased taxes. While many regulatory improvements have justified their expense, the attempt to solve individual problems without reference to a comprehensive plan for city development can never be wholly successful. Nor will the funds so expended be most efficiently used. All the factors which contribute to the development of a city are so interrelated that no single problem arising from this development can be effectively handled alone.

The Outlook for City Planning

It has been demonstrated that city growth can be directed into proper channels with advantage and profit and without hardship or loss. It merely requires careful planning and firm administration. Unfortunately our cities do not easily respond to scientific control. Changing administrations and confused political issues still dominate the more important matters of economic and social improvement of city life. Prejudice and sentiment (for high buildings, for example) still supersede reason and plain fact (low building height limitation to curb congestion—to complete the analogy).

Many cities are now taking advantage of the principles of city planning by carefully devised street systems, by rerouting of transit lines, by improved transportation and terminal facilities, by zoning ordinances and by comprehensive recreation systems. Few cities have had sufficient courage and determination to do each and all of these things in a truly comprehensive and well-balanced manner. Compromise on one or more phases of the plan often destroys the cumulative value of the plan as an entity, and thereby destroys unity in city design. In one city several million dollars are being spent on street widening, and the justification for the whole expenditure is threatened with nullification by an arbitrary and unwarranted rerouting of transit lines over which the city has no control.

An alert and enlightened electorate, strong community leadership, and city officials interested more in their work than their jobs are needed. With these assets there can be devised plans for cities that will reduce the waste of city growth. It is not to be expected that changes in conditions that have developed gradually through many years can be effected quickly. So much of city planning practice has already been accepted, however, that no appreciable change will accompany the full acceptance of a comprehensive planning program. Individual initiative and enterprise will have as great if not greater fields of action, but there will be a premium upon individual enterprise directed toward community betterment rather than upon activities which show a profit at community expense. Legislation is generally satisfactory for the execution of city planning programs and the courts are usually quick to respond to new measures for municipal improvement. That "new times demand new measures and new men" was never more true than today. The new times are here. The new measures are at hand. Will the new men be found among our present business leaders or must they come from other fields?

WATER-POWER SITUATION IN THE UNITED STATES

By WALTER H. VOSKUIL

THE popular imagination has been caught in recent years by the spectacle of hydro-electric energy being carried all over the country on high-power transmission lines. Truly there is something of romance in the conception of energy unlocked from Pacific coast rivers and carried to Missouri, let us say, where it is used in manufactures or in saving labor in the homes or on the farms. Most people visualize the proposed superpower developments as a great forward step in increasing the material conveniences and comforts of existence in a country which already has developed further along this line than probably any other country.

Undoubtedly our present industrial society would not have developed to the extent that it has, were it not for man's harnessing of mechanical energy in one form or another. The dependence of our material civilization upon mechanical power has been tersely summarized as follows:

> In the struggle for existence man has attained superiority through a facility for turning the forces of nature into account. In modern life the expression of this facility is industrialism—the cooperative employment of mechanical power for useful work; the delegation of service to machines energized by coal, oil, and water-power; the organized gaining of a livelihood. Mankind is therefore dependent upon industrialism and industrialism is contingent upon a supply of power.[1]

In view of this dependence, it is pertinent to inquire whether or not the prospects for the future are as bright as many advocates of superpower projects have asserted. What are the potential and actual power resources of the United States? To what extent have we relied in the past upon water-power as compared with other forms of power? What are the national requirements of power? How much of our potential water-power is actually used now or may be developed in the near future? How much water-power can be practically developed, with due regard to economic, technical, or other limitations? These are significant problems in the future development of the water-power resources of the United States. An analysis of the present water-power situation in this country will, it is believed, point out the difficulties and help toward accurate and scientific thinking on the subject.

Uses and Sources of Energy

Energy is used for various purposes and in many forms. It is needed to generate steam under stationary boilers, to drive locomotives, to propel steam-driven and oil-driven ocean vessels; in the form of a liquid, it supplies power for a vast number of automobiles, trucks, aeroplanes, and so forth; in the form of electrical energy, it is used for lighting purposes and for driving machinery.

There are several sources of energy from which to choose in performing the functions mentioned above. The most

[1] Gilbert, C. G. and Pogue, J. E.: "Power: Its Significance and Needs," *Smithsonian Institution, United States National Museum Bulletin* 102, Part 5.

important are coal, petroleum, and water-power. Other sources have been mentioned, such as alcohol derived from carbohydrates, vegetable oils, harnessing of the tides. The first-named group, however, is at present the only important source.

Any one of these three forms of energy cannot by itself supply all the energy called for by man's various activities. Coal, in its raw state, the most widely used energy resource of all, cannot drive internal combustion engines.[2] Petroleum is too limited in quantity to be considered as a fuel for general purposes, and for this reason it will never supplant coal. Water-power can furnish power for mills directly or can be made to produce electrical energy. The total water-power available is insufficient to supplant coal in the development of the electrical energy required for power purposes and lighting. All of these sources of energy are necessary and useful to meet the power requirements of man. Their proper coordination is an economic problem of great importance and has a direct bearing on the cost of power.

In this discussion the possibilities and limitations of water-power as a factor in contributing to the power requirements of the United States will be considered. Only a general survey will be attempted at this time, reserving for later discussions a more detailed study and analysis of water-power conditions in each of the geographic divisions, or drainage basins.

[2] Coal can, however, be made to yield gas and benzol which can take the place of gas and gasoline to a certain extent, if necessary.

[3] "These figures are very rough, based on an assumed power utilization of 150,000,000 horse-power (which may be fairly wide of the mark) and the equivalence of 20 man-power for 1 horse-power. As a matter of fact, this country has no adequate record of its total power consumption." *Op. cit.*, Gilbert, C. G. and Pogue, J. E., page 7, footnote 3.

[4] Wyer, S. S., *Power Situation in the United States*, supplementing *Power: Its Significance and Its Needs*, p. 2.

[5] "World Atlas of Commercial Geology," *United States Geological Survey*, 1921, Part II, Water-Power of the World, p. 14.

[6] *Third Annual Report of the Federal Power Commission*, for year ending June 30, 1923.

The Place of Water-Power in the Power Supply

It is difficult, if not impossible, to determine the power requirements of the United States. In a discussion of *Power: Its Significance and Its Needs*, Gilbert and Pogue assume a figure of 150,000,000 horse-power as representing the needs of the nation.[3] In a supplement to this report, it is estimated that the total stationary power developed in the United States is, in round numbers, 49,000,000 horse-power.[4]

Of this, approximately 9,500,000 horse-power was developed by water-power in 1920.[5]

The Water-Power Act of 1920 gave impetus to further development of water-power so that the figures given for 1920 do not represent the situation as it exists today.

The progress in water-power development since 1920, as reported by the Federal Power Commission, is as follows:[6]

Item	Installed Capacity (Horse-Power)
Total development in the United States, 1920	9,500,000
Built or building under the Federal Water-Power Act of 1920, 1920-1923	2,000,000
Licenses granted during 1920-1923	2,500,000
Licenses granted and permits authorized, for 1920-1923	8,500,000
Applications filed, ending June 30, 1921.	15,000,000
Applications filed, ending June 30, 1922.	5,000,000
Applications filed, ending June 30, 1923.	1,500,000
Applications filed, 1920-1923	21,500,000

It is to be noted that the development of much of the power for which appli-

cations have been filed may not be undertaken for several years. It should also be observed that the number of applications filed in the fiscal year June, 1921-1922, is only one-third of the previous year, and that the applications for the year 1922-1923 equal only one-tenth of those filed the first year after the law went into effect. This may indicate that the 21,500,000 horse-power for which applications have been made represents nearly the maximum horse-power that it is economically feasible to develop under present conditions.

Water-Power Used Directly in Manufacturing

Although water-power played an important part in the early manufacturing industries, especially in New England, it is now unimportant, and is declining in total amount as well as in percentage of total power used. This is best illustrated by the following table:

TABLE I. GROWTH OF TOTAL HORSE-POWER USED IN MANUFACTURING, WATER-POWER USED IN MANUFACTURING, AND PERCENTAGE OF WATER-POWER TO TOTAL [7]

Year	Total Horse-Power	Water-Power	Per-centage
1869	2,346,142	1,130,431	48.1
1879	3,410,837	1,225,379	35.9
1889	5,938,635	1,255,045	21.1
1899	10,097,893	1,454,112	14.4
1904	13,487,707	1,647,880	12.2
1909	18,675,376	1,822,888	9.8
1914	22,437,072	1,826,443	8.1
1919	29,504,792	1,765,263	6.0

The water-power thus employed is found principally in New England and the Middle Atlantic states, and consists mainly of small units. In Maine, for example, 50% of all the power used in manufacturing is developed by water-wheels, turbines, and motors. The use of water-power in manufacturing is less important in the remainder of the United States, as is shown by Table II.

TABLE II. RELATIVE IMPORTANCE OF WATER-POWER USED (DIRECTLY) IN MANUFACTURING AND TOTAL HORSE-POWER BY GEOGRAPHIC DIVISIONS [8]

Division	Total Horse-Power	Water-Power	Per-centage
New England.....	3,796,846	747,617	19.7
Middle Atlantic....	8,537,660	396,168	4.6
East North Central.	7,735,137	252,829	3.3
West North Central	1,594,112	92,753	5.8
South Atlantic.....	2,795,094	173,108	6.2
East South Central.	1,415,577	25,007	1.8
West South Central.	1,185,989	3,446	0.3
Mountain.....	686,579	15,656	2.3
Pacific.....	1,757,798	58,679	3.3
Total.....	29,504,792	1,765,263	6.0

Water-Power for Electrical Energy

Electrical energy is fast becoming important for manufacturing industries as well as for lighting and electric railways. Analysis of the primary horse-power used in manufacturing in the United States shows that 9,347,556 horse-power, or 31.2% of the total power used, is in the form of electrical energy.

The proportion of electric power to total power used in manufacturing is shown in Table III.

Of greater significance, probably, is the increasing proportion of electrical energy used in manufacturing as compared with the total amount of power used, shown in Table IV.

The tardy development of the electric motor in industry is partly due to hesitation on the part of the plant own-

[7] Abstract of *Census of Manufactures, 1919*, p. 460.

[8] Abstract of *Census of Manufactures, 1919*, p. 470.

TABLE III. TOTAL POWER USED IN MANUFACTURING, ELECTRIC POWER USED, AND PROPORTION OF ELECTRIC TO TOTAL [9]

Division	Total Horse-Power	Electric Power	Percentage
New England.....	3,796,846	1,130,308	29.7
Middle Atlantic....	8,537,660	2,455,360	28.6
East North Central.	7,735,137	2,659,498	34.4
West North Central	1,594,112	596,189	37.4
South Atlantic.....	2,795,094	887,201	31.7
East South Central.	1,415,577	311,138	22.0
West South Central.	1,185,989	218,558	18.4
Mountain.....	686,579	259,619	37.8
Pacific.....	1,757,798	829,685	47.2

ers to scrap their existing steam plants. However, the obvious advantages of the electric motor eventually overcame this inertia so that from 1909 to 1919 the rate of increase was very rapid. With the use of electrical energy, smaller motors are possible than with steam or internal combustion engines. Of the total power used for manufacturing in the United States, the average size of the unit for each type of motor is as given in Table V.

Moreover, electric power can be transported to any part of a plant, or to a plant anywhere in the city or its vicinity without much loss of energy. It adapts itself to units of any size from a fraction of a horse-power to several hundred horse-power. Cleanliness, compactness, high speed, adaptability to a variable load are other factors which contribute to its desirableness as a form of power. Hence, one finds the tendency to concentrate steam, and to some extent gas, into larger power units for the generation of electrical current in which form the energy is distributed over transmission lines to the points needed.

In regard to the consumption of energy for lighting and street railways,

[9] Abstract of *Census of Manufactures, 1919*, p. 470.

Wyer estimated a use of 24,000,000 horse-power of which 6,800,000 is developed by water-power.[10]

Although the use of water-power for mechanical energy is now unimportant and soon will be negligible, the use of water-power in contributing to the electrical energy requirements of the country will increase until a considerable portion of the most favorably situated sites are developed. Much can be said about the physical advantages of a water-power site as compared with a steam plant, but such discussion is irrelevant. The determining factor in the development of the power site is the cost of hydro-electric energy as compared with carbo-electric energy. In addition, the reliability of service must be taken into account. A purchaser of electric power could not easily be induced to buy power from a hydro-electric plant, however cheap, if there was danger of an interruption of service which was not expected in a steam plant.

Comparative Costs of Steam-Electric and Hydro-Electric Plants

As has been stated above, the limits of water-power development are governed by the cost of manufacturing elec-

TABLE IV. PROPORTION OF ELECTRIC POWER TO TOTAL POWER USED IN MANUFACTURING, FOR SPECIFIED YEARS [9]

Year	Total Horse-Power	Electric Power	Percentage
1869	2,346,142	*	*
1879	3,410,837	*	*
1889	5,938,635	*	*
1899	10,097,893	182,562	1.8
1904	13,487,707	441,589	3.3
1909	18,675,376	1,749,031	9.4
1914	22,437,072	3,897,248	17.3
1919	29,504,792	9,347,556	31.2

[10] Wyer, S. S. *Power Situation in the United States*, p. 2.

TABLE V. TOTAL POWER USED IN MANUFACTURING, BY TYPES OF POWER, AND AVERAGE POWER PER UNIT [11]

Type of Power	Number of Plants	Total Power	Average Power per Unit (Horse-Power)
Steam engines.....	116,183	13,839,832	119
Steam turbines.....	6,445	3,198,141	4955
Internal combustion engines.....	33,407	1,259,400	38
Water-wheels (turbines) and motors..	14,008	1,765,263	126
Electric motors.....	996,000	9,347,556	9.4

trical energy from coal. When the total costs of operating a hydro-electric plant exceed that of a carbo-electric plant, coal and not water-power will be used. This cost, of course, varies with locality and project. The cost of producing electrical energy is made up of "Original Investment" and "Operating Costs." These may be further subdivided and classified as follows:

1. Original Investment
   - (*a*) Interest
   - (*b*) Depreciation
   - (*c*) Taxes and Insurance
2. Operating Costs
   - (*a*) Production
   - (*b*) Transmission
   - (*c*) Distribution
   - (*d*) Administration

Fundamentally the hydraulic turbine has a great advantage with an efficiency about eight times that of the steam engine or steam turbine, and with lower operating costs. It might seem at first thought, therefore, that water-power would always be cheaper and more desirable. The usual high, first cost of a water-power plant, almost always higher than that of a steam plant, means, however, greater fixed charges.

Under "Operating Costs," steam-electric plants must be compared with hydro-electric plants under the subdivisions of "Production" and "Transmission." The "Distribution" and "Administration" costs are approximately the same for each type of plant.

Taking up first the cost of "Original Investment" under Maine conditions, the cost of a steam plant is about $85 per kilowatt.[12]

The annual fixed charges of steam-electric plants are calculated at 10½% to 13%, divided as follows:

Interest, 5-6%
Depreciation, 4-5%
Taxes and Insurance, 1½-2%

The average cost per horse-power of hydro-electric plants of the developed sites in Maine is $114. The variation in cost is extreme, ranging from $60 per horse-power to $250 per horse-power on the wheel shaft with 100% load factor. With 50% load factor these costs vary from $80 to $290.[13]

Annual fixed charges of the hydraulic plants are calculated as follows:

Interest, 5-6%
Depreciation, 2-3%
Taxes and Insurance, 1-2%

In view of the large original cost, the annual fixed charges of the hydro-electric plants, hence, are on the average higher.

Under "Operating Costs," steam power must be compared with hydro-electric power up to the switchboard or the substation on the transmission line. Without giving a detailed statement of the comparative costs under Maine con-

[11] Abstract of *Census of Manufactures, 1919*, p. 460.

[12] Data from the *Special Water Power Report of the Public Utilities Commission, State of Maine*, 1918.

[13] For a detailed discussion of the costs of steam- and water-power see *Special Water Power Investigation of the Maine Public Utilities Commission*, p. 369.

ditions,[14] the report shows that the cost of hydro-electric energy is about 0.5 to 0.9 cents per kilowatt-hour as compared with steam which is 1 cent to 1.25 cents per kilowatt-hour up to the point of distribution a slight advantage for the water-power plants.

In considering these figures, it must be borne in mind that these comparative costs were made under Maine conditions where distances of transmission are comparatively short. If this analysis were applied to the western states where the power would, in many cases, have to be carried much farther, the cost of transmission would mount to a considerable figure.

Water-Power Possibilities of the United States

The potential water-power of the United States is estimated by the United States Geological Survey as follows:

Total Potential Power	Horse-Power
Minimum	27,943,000
Maximum	53,905,000

Commenting upon these estimates, it is said:

> The use of storage was not considered; the minimum horse-power is that obtainable at minimum flow, and the maximum horse-power is that obtainable with the flow available for 50% of the time. The mean flow for each of the lowest two seven-day periods in each year was determined, and the mean of these two means for the period of record was taken as the minimum flow. The estimates for both the minimum and the maximum horse-power are conservative. In some of the New England states complete development would probably require the installation of plants having a capacity of four times the estimated potential power at low water. If all the water-power in the United States were similarly developed, the total capacity of the plants would be 112 million horse-power, and if this estimate is correct the water-power resources of the United States are now only about 8% developed.[15]

If the maximum is assumed, it will be noted that the total potential water-power of the United States, without storage, is roughly equal to the power consumption of the United States in manufacturing, central stations, and electric railways.

The proportion of potential water-power to the power used in manufacturing in 1920 for each geographic division is as given in Table VI.

TABLE VI. PROPORTION OF POTENTIAL WATER-POWER TO POWER USED IN MANUFACTURING IN 1920, BY GEOGRAPHIC DIVISIONS

Geographic Division	Power Used in Manufacturing	Potential Water-Power	Percentages
New England	3,796,846	1,605,000	42.3
Middle Atlantic	8,537,660	2,488,000	29.1
East North Central	7,735,137	1,604,000	20.7
West North Central	1,594,112	1,956,000	122.6
South Atlantic	2,795,094	4,257,000	152.3
East South Central	1,415,577	1,964,000	138.7
West South Central	1,185,989	822,000	69.4
Mountain	686,579	16,131,000	2345.
Pacific	1,757,798	23,078,000	1307.
Total	29,504,792	53,905,000	

An examination of this table shows first that regardless of whether it were economical to do so or not, the potential water-power would supply but a small percentage of the total power requirements for manufacturing in the industrial sections of the United States, particularly the Middle Atlantic and East North Central divisions, not to mention the use of water-power for generating the electricity required in lighting, street railways, and possibly railroads; second,

[14] For details, see above-mentioned report.

[15] *Op. cit.*, "World Atlas of Commercial Geology," 1921. Part II, Water Power of the World, p. 13.

that in the Mountain and Pacific divisions, which contain within their borders 72% of the total potential water-power, the possible supply of electrical energy far exceeds the amount required by present manufacturing establishments. The relation of this to the feasibility of developing the water-power resources of the West will be discussed in somewhat greater detail later.

The Development of Water-Power in the United States

EARLY WATER-POWER DEVELOPMENT. In the early part of the nineteenth century before the extensive use of coal, water-power performed a great service in turning the mills of industry. Water-power influenced the location of industrial centers some of which have since passed over to the use of steam-power. The cities of the "fall line" are examples. With the rapid growth of industry, however, water-power lagged behind so that, whereas in 1869 nearly 50% of the power used in manufacturing was derived from water-wheels, turbines, and motors, in 1919 only 6% was so derived.

The introduction of the electric motor in manufacturing, and of the electric railway in city transportation, has served to release water-power somewhat from the limitations imposed upon it by its immobility, so that now water-power in hydro-electric plants is again likely to supply a considerable portion of our power needs. The greatest development is likely to take place in the Mountain and Pacific states where 72% of the total water-power resources are located.

In 1900 the developed water-power in the United States was estimated at 3,300,000 horse-power. By 1920 it had risen to 9,500,000 horse-power. The growth of water-power in the period 1900-1920 is shown in Table VII.

TABLE VII. CAPACITY OF STATIONARY PRIME MOVERS IN THE UNITED STATES [16]

Year	Total	Horse-Power Water-Power	Percentage of Water-Power Used
1900	17,500,000	3,300,000	18.8
1902	19,500,000	3,700,000	19.0
1904	22,500,000	4,100,000	18.2
1906	25,500,000	4,700,000	18.4
1908	29,000,000	5,360,000	18.5
1910	32,500,000	6,000,000	18.4
1912	36,000,000	6,700,000	18.6
1914	38,500,000	7,400,000	19.2
1916	42,000,000	8,200,000	19.5
1918	45,000,000	8,800,000	19.5
1920	49,000,000	9,500,000	19.4

This table includes both the water-power developed under state authority and that developed under federal authority.

WATER-POWER LEGISLATION. The power of Congress to control water-power development on public lands and reservations, on navigable waterways in the United States, and on streams forming or crossing international boundaries is derived from three definite provisions of the Constitution.[17]

From time to time legislation controlling the development of water-power was enacted by Congress, but, until the passage of the Act of 1920, such legislation was unsatisfactory, and tended to retard power and development. The situation previous to this act may be summarized as follows:

1. Water-power resources of the United States were under the jurisdiction of three departments:

[16] *Op. cit.*, "World Atlas of Commercial Geology," Part II, Water Power of the World, p. 14.

[17] For a discussion of water-power legislation passed from time to time by Congress, including the Federal Water Power Act of 1920, see the *First Annual Report of the Federal Power Commission*, 1921, pp. 43-81.

(*a*) Department of Agriculture, with jurisdiction over water-power in the national forests;

(*b*) Department of Interior, with jurisdiction over water-power on public lands and reservations;

(*c*) War Department, with jurisdiction over water-power on navigable streams.

2. The laws governing water-power were such as to leave tenure uncertain, and hazards to investors great.

Judging from results obtained after the Act of 1920 was passed, water-power development was hindered quite as much by unsatisfactory laws as by the competition of other forms of power.

The Act of 1920

In order to remedy the unsatisfactory conditions of the law which was retarding the development and use of water-power, and to unify and bring under one head the administration governing the development of water-power, Congress enacted the Federal Water-Power Act which was approved by the President on June 10, 1920.

This act creates a commission consisting of the secretaries of the three departments involved and an executive secretary appointed by the President. The staff of the commission is drawn from the clerical, legal, and engineering forces of the three departments. The functions and duties of the commission, as conceived by the commissioners, are as follows:

> By the terms of the Federal Water-Power Act the commission is required to investigate all projects applied for to determine whether the structures are safe and properly designed and whether full utilization will be made of the resources of the stream. It is required to make full valuations of all properties licensed under the act and constructed prior to the issuance of the license. When declarations are filed of intention to construct dams in streams whose navigable status is doubtful, it must investigate and determine whether the interests of interstate or foreign commerce would be affected. It must investigate and pass upon applications for restoration to entry of lands within power-site reserves. It is required to establish a system of accounting to be applied to the operations of its licensees and by means of which the net investment in the properties may always be known. It must assume ultimate responsibility for seeing that licensed projects are properly maintained and that adequate depreciation reserves are established. . . . It must be prepared to assist in the defense of the act before the courts.[18]

In place of the uncertain tenure and unknown requirements of previous legislation an applicant for a power project under this act may secure a license for a term not exceeding 50 years. The license is a contract between the government and the licensee, expressly contains all the conditions which the licensee must fulfil, and, except for breach of conditions, cannot be altered during its term either by the Executive or by Congress without the consent of the licensee. If the licensee fails to commence construction under his license, it can be canceled by executive action, but after construction has started only by judicial action, and then only if no other appropriate legal remedy is available.

When the license period expires the United States may take over the properties of the licensee for its own use, permit them to be taken by another, or issue a new license to the old licensee. If the properties are taken away, the licensee must be paid his "net investment" in the properties, an amount equal to the actual investment plus severance damages and less such sums in depreciation and amortization reserves as have been accumulated during the period of the license after having received a fair return on the investment. If the license is renewed, it must be "upon reasonable terms." While "unearned increment" and intangibles are not to be recognized, the basis of payment protects every dollar of actual, honest investment in the properties.

The licensee is required so to plan his project that it will conform to a scheme of development providing for the fullest reasonable utilization of the resources of the stream. He must maintain his plant in good operating

[18] *Second Annual Report of the Federal Power Commission*, 1922, p. 6.

condition, make the necessary replacement of worn out or obsolete equipment, provide out of earnings adequate depreciation reserves for such purpose, and maintain a system of accounting in such form as may be prescribed. He must also pay reasonable annual charges for reimbursing the United States for a proper share of the cost of administration of the act and for recompensing it for the use of its land or other property.[19]

CERTAIN DEFECTS OF THE ACT. The chief purpose in the creation of the commission was to secure a common policy and a single executive agency in water-power administration. This purpose has not been accomplished. To perform the greatest task with respect to water-power that the government has ever had, Congress gave the commission no personnel other than the executive secretary and engineer officer, but obliged it to borrow for its work such personnel as the departments could spare and were willing to loan. Other agencies have been required to continue their independent investigations, and these activities are not controlled by a common plan and are not subject to a common direction.

The provision of adequate personnel is prerequisite to the removal of decentralized administration. This need has been recognized by other government agencies.

What is seriously needed in the interest of an adequate administration of the act is a small organization of trained and experienced men capable of meeting intelligently the important and perplexing engineering and economic problems which are constantly arising and upon which will depend the value of the legislation and, in no small degree, the future of the hydro-electric power industry.[20]

[19] *First Annual Report of the Federal Power Commission*, 1921, pp. 50, 51. This report includes a copy of the text of the act.

[20] *Op. cit.* "World Atlas of Commercial Geology," 1921, Part II, Water Power of the World, p. 16.

The Development of Water-Power under Federal Authority since the Act of 1920

It is estimated that 85% of the potential water-power of the United States is under federal control.[21] This places upon the Federal Power Commission a heavy responsibility in the examination and approval of licenses for water-power development.

Under the laws existing before 1920 the risks and uncertainties attending water-power development were so great that the construction of projects practically ceased. These conditions were entirely changed under the new law. Immediately following the approval of the act a flood of applications was received. Projects long delayed were immediately approved and construction started after the approval of the act. The history of three projects affecting navigable rivers —The Coosa River project, the Connecticut River project, and the Niagara Falls project—well illustrate the comparative value of present and former legislation in the means afforded both for expediting action and for handling special problems in individual cases.[22] These projects represent an ultimate development of approximately 390,000 horse-power. Of greater significance is the flood of applications for new development which have come into the commission. During the first three years of its administration the commission received applications involving an estimated installed capacity of 21,500,000 horse-power and issued licenses and permits for an aggregate installation of

[21] *Second Annual Report, Federal Power Commission*, 1922, p. 7.

[22] For a discussion of the three projects mentioned above, see *First Annual Report, Federal Power Commission*, 1921, pp. 6-10.

7,500,000 horse-power of which 2,400,000 are built or building. When it is realized that previous to 1920 the capacity of all water-power plants in the United States amounted to only 9,500,000 horse-power the satisfactory character of the legislation in general becomes apparent.

The commission issues permits usually for a period of 3 years during which time the applicant is given the opportunity to make preliminary surveys and estimates of cost and capacity of the plant before submitting a formal application. With the filing of the application the commission examines the plans, and if it approves of the project, a license is granted for construction. The license expires at the end of 50 years, or in the case of minor projects usually at the end of 25 years.

Progress of Development

A. Applications

The Federal Water-Power Act became effective June 10, 1920. The record of applications during the first three years of the commission's administration is given in Table VIII.

Table VIII. Number of Applications Received by Federal Power Commission, with Horse-Power Capacity, 1920-1923

Applications Received	Number	Primary Horse-Power	Estimated Installed Capacity in Horse-Power
Previous to July 1, 1920.....	15	1,695,270	2,388,240
July 1, 1920, to June 30, 1921...	214	13,837,815	19,933,955
July 1, 1921, to June 30, 1922...	70	1,663,160	4,246,745
July 1, 1922, to June 30, 1923...	69	3,219,335	6,006,555
Total.....	368	20,415,580	32,575,495

These applications involve 36 states, Alaska, and the District of Columbia. The 10 leading states in which applications were filed are shown in Table IX in the order of their importance.

A study of the above table shows that 84% of the total primary horse-power applied for is found in one eastern state —New York—and four western states —Arizona, California, Washington, and Utah.

These applications represent, after deductions for conflicts, rejections and withdrawals, an aggregate of 12,500,000 primary horse-power, and an estimated installed capacity of 21,500,000 horse-power. Forty-five per cent of the total applies to the St. Lawrence, Columbia, and Colorado rivers.

B. Permits and Licenses

In the meantime permits and licenses have been issued for the aggregate horse-power shown in Table X.

In three years' time the total primary horse-power for which permits and licenses have been granted is 3,550,000 horse-power, or 37½% of the total water-power developed in the United States before 1920. The total primary horse-power for which applications have been made is 12,500,000, or 131% of that developed previous to 1920.

Résumé of the Water-Power Situation in the United States

The foregoing discussion may be briefly summarized as follows:

1. The water-power resources of the United States are wholly inadequate to supply even that form of energy requirement—electrical energy—which they are best suited to give.

2. The direct use of water-power in

TABLE IX. GROSS HORSE-POWER APPLIED FOR, BY STATES, 1920-1923 [23]

(No deductions made for conflicting applications)

State	Number of Applications	Primary Horse-Power	Percentage of Total	Estimated Installed Capacity	Percentage of Total
United States	368	20,415,580	100.0	32,575,495	100.0
Arizona	17	7,380,920	36.1	10,000,000	30.7
New York	10	3,650,125	17.9	4,422,830	13.6
California	117	3,110,700	15.2	6,485,040	19.9
Utah	8	1,581,860	7.7	2,238,665	6.9
Washington	14	1,099,360	5.4	1,927,550	5.9
New Jersey	2	530,400	2.6	632,300	1.9
Tennessee	4	417,000	2.0	666,000	2.0
Oregon	16	403,807	2.0	698,240	2.1
Idaho	23	402,795	2.0	846,240	2.6
Montana	18	398,510	2.0	730,670	2.2
All others	139	1,440,103	7.1	3,927,960	12.1

manufacturing and industry is no longer an important factor and is already declining slightly.

3. The use of water-power for the production of electrical energy is increasing in about the same proportion that the total energy requirements of the United States are increasing (1920).

4. The development of water-power has been retarded to a considerable degree by unfavorable legislation as well as by competition with other forms of energy.

5. The Act of 1920 has given great impetus to water-power development.

Limitations of Water-Power Development

The limitations of water-power as a source of supply for the energy requirements of the United States have been mentioned occasionally in the preceding discussion. It may be well to summarize and discuss briefly these limitations. The utilization of water is limited with respect to:

1. Supplying power in the form of electrical energy;
2. The area in which water-power resources are present;
3. The industries which use power in the form of electrical energy; [24]
4. The cost of competing sources of energy;
5. The ultimate consuming capacity of the community.

It will be found that one or more of the above factors operate to limit the extent to which the potential water-power resources can be harnessed for the purpose of supplying energy.

I. Supplying Power in the Form of Electrical Energy

It has been shown in the preceding discussion that a large amount of energy used must necessarily be in a form other than electrical. The automobile,

[23] *Third Annual Report, Federal Power Commission*, 1923, p. 12.

[24] This limitation was discussed previously, pp. 91-92.

TABLE X. NUMBER OF PERMITS AND LICENSES, AND HORSE-POWER CAPACITY

Number	Horse-Power	
	Primary	Installed Capacity
Permits..... 81	2,528,125	5,045,380
Licenses.....106	1,037,803	2,605,486

the internal combustion engine, the aeroplane must depend upon liquid or gaseous fuel as a primary source of energy. Ocean liners and naval vessels, though sometimes electrically driven, must carry with them coal or oil. Moreover, water-power cannot supply that long list of useful by-products obtainable from coal and petroleum; but this is beside the point in the present discussion.

An examination of the electric-power requirements of the United States shows, however, that the quantity used at the present time is, in the industrial sections of the United States, in excess of the total potential hydro-electric power. In the Mountain and Pacific states, where the possible hydro-electric power is far in excess of the electric power actually used, a limiting factor does enter in, but this is properly discussed under limitations imposed by the ultimate consuming capacity of the community.

II. The Area in Which Water-Power Is Present

At the present time the transmission of power in the form of currents of high voltage and low intensity through the use of transformers is not economical beyond 300 or 400 miles. The distance will be governed somewhat by the cost of the power generated by competing steam and gas plants. Transmission involves a power loss of 10% to 20%; erection and maintenance of the lines also is expensive. Hence a point is reached where costs of transmission exceed the value of the power transmitted. "In the great project for harnessing the Rhone conceived in 1917 the cost of carrying the power 400 kilometers (approximately 250 miles) to feed the great plant of Genissiat at Paris proved nearly as great as the operation of the plant itself. To improve transmission of power between the Northern Alps and the Lyons region new lines were constructed, the cost of which was so great that it could only be borne by a combination of the several hydro-electric associations. The advantage evidently lies with those industries situated near the central power stations." [25]

The enormous water-power resources of the Mountain and Pacific states can be fully utilized only if a local market is developed. To carry this energy to the Mississippi Valley or the eastern states is economically and mechanically impracticable. The interconnection of hydro-electric plants with each other and with carbo-electric plants to transmission lines of high voltage and high carrying capacity will aid somewhat in extending the present range of transmission.

III. The Competition of Coal and Oil

Another aspect of the problem of the economic utilization of hydro-electric force is the competition of coal. It has been stated that the exploitation of hydraulic electricity on a large scale necessitates that the producing stations be situated accessibly and that the power generated be utilized as near the stations as possible. Coal, on the other hand, can be moved to the centers where

[25] Blanchard, Raoul, "Geographical Conditions of Water Power Development," *Geographical Review*, January, 1924, p. 92.

energy is required, and, in countries where this resource is cheap and abundant, water-power cannot compete. Wyer states that "Under Pennsylvania conditions out of each dollar that the public pays for electric energy, 21 cents goes for fuel of which 14 cents is for mining the coal and 7 cents is for transportation." [26]

"Niagara Falls provides an exceptionally dependable and therefore cheap water-power. In round numbers it makes possible a cost of current, including overhead at the station, around 2 mills per kilowatt-hour. At modern plants in this country current made from coal costs from 5 to 6 mills in the same round figures . . . . So that the difference in cost between current derived from the best water-power of which we know anything and that derived from steam-driven generators is not more than 3 or 4 mills. Whatever the difference, it is sure to be much reduced by practicing economies which are clearly just ahead, such as by-product recovery and the wide-spread integration of the transmission and distribution systems with the attendant cutting down of standby equipment and increase and diversity in load factor." [27]

It is clear that only a small part of the retail cost of electrical energy is represented by the cost of fuel. Hence, in the coal-producing regions hydro-electric development can take place only under exceptionally favorable conditions.

The competition of oil must also be considered. In California, despite the wide-spread use of hydro-electric energy, oil now produces over 70% of the total energy being utilized in the state.[28] The peak of California oil production, however, has been reached, and a gradual increase in the proportion of hydro-electric energy to supply the power needs may be expected.

IV. The Ultimate Consuming Capacity of the Community

It would seem paradoxical to say that the extent to which water-power can be developed is governed by the capacity of a community to consume power when all the water-power of the United States can only supply a fraction of the total power demand. Yet because of the distribution of water-power resources in relation to the possible power demand, this may actually be the case. Table VI shows that at the present time the power used in the Mountain states is only 4.25% of the potential water-power and in the Pacific states it is 7.6%. Unless industries can be developed which can utilize this power, much of the water-power resources must long remain unused for want of a market.

[26] Wyer, S. S. *Power Situation in the United States.*

[27] Cooke, M. L., "The Long Look Ahead," in *Survey Graphic,* March 1, 1924, p. 651.

[28] *Water Supply Paper 493, United States Geological Survey,* 1923.

FARM-MORTGAGE INTEREST RATES

By CLARA F. WIGDER

CONDITIONS affecting farm-mortgage interest rates are primarily local in character. There are, however, certain factors that apply in a general way to homogeneous areas, and it is with these latter factors that this article is concerned.

To obtain the proper farm-mortgage interest rate areas, the average rates for all the counties in the United States, as reported by the 1920 Census, were placed on a map and the country was then divided into interest rate groups. These figures represent the interest paid only, and do not include commissions or fees. The unit of division chosen was one-half of 1%, although in a few instances this unit proved too small and a larger unit had to be used. As a result of this grouping, the country was divided into 15 sections which have fairly homogeneous physical, economic, agricultural, and social characteristics. Owner-operated farms only were included in gathering farm-mortgage data, since it was believed by the Census authorities that managers and tenants would not be familiar with, nor in a position to give, accurate information with respect to the mortgage conditions. (Table I.)

In order to eliminate the influence of the extremes on the average, the comparison given in Table II was made with the median or middle item in the array and modal or dominant rates, the median, perhaps, being the most representative.

Of the total number of farms in the United States, 3,925,090 are owner-operated (60.9%) and of this amount 1,461,306, or 37.2%, were reported as mortgaged. The percentage of owner-operated farms reporting mortgages has increased each census year since 1890 as can be seen in Table III.

This increase in the number of mortgaged farms has been accompanied by an increase in land values and decrease in interest rates. Chart I on page 114 compares the 1890 and 1920 farm-mortgage interest rates, and shows that with few exceptions the rate has decreased.

The increase in the value of farms

TABLE I. PERCENTAGE OF ALL FARMS OPERATED BY OWNERS, BY STATES, 1920

State	Percentage of Owner-operated Farms	State	Percentage of Owner-operated Farms
United States...	60.9	Delaware.....	59.3
		Maryland.....	68.5
Maine.....	92.2	Virginia.....	73.2
New Hampshire.	90.6	West Virginia..	82.6
Vermont.....	86.4	North Carolina.	56.1
Massachusetts...	87.8	South Carolina.	35.1
Rhode Island...	79.5	Georgia.....	32.9
Connecticut....	86.8	Florida.....	71.3
New York.....	78.5	Kentucky.....	66.3
New Jersey.....	73.7	Tennessee.....	58.6
Pennsylvania...	75.9	Alabama.....	41.4
		Mississippi....	33.6
Ohio.....	69.3		
Indiana.....	66.9	Arkansas.....	48.4
Illinois.....	55.9	Louisiana.....	42.3
Michigan.....	81.1	Oklahoma.....	48.6
Wisconsin.....	84.3	Texas.....	46.1
Minnesota.....	74.4	Montana.....	87.2
Iowa.....	57.1	Idaho.....	82.3
Missouri.....	70.4	Wyoming.....	85.1
North Dakota...	73.3	Colorado.....	75.6
South Dakota...	64.1	New Mexico...	86.3
Nebraska.....	56.0	Arizona.....	78.9
Kansas.....	58.7	Utah.....	88.0
		Washington....	79.5
		Oregon.....	79.4
		California.....	74.4

from 1910 to 1920 naturally follows the events of that decade, and Table IV is presented to show the relationship between the amount of the mortgage debt and the value of the farms at these two dates, and not to show the absolute increase. (Chart II, page 115.)

It should be borne in mind that this study concerns itself more with relationships than with absolute figures. The criticism may be made that changes in the value of money have not been taken into consideration, and that 1920 figures represent peaks and inflation. The existence of these and other disturbing elements must be admitted. On the other hand, in the attempt to find correlations with the interest rates, these irregularities are not so pertinent, since all the correlations are for the same period.

Perhaps the most important correlation with farm-mortgage interest rates is their inverse relationship to land values. The value per acre of land alone for each county in the United States was plotted on a map and the country divided into land value areas in the same manner that was done with the interest rates. A glance at Maps I and II immediately shows the contour lines taking similar directions in both maps.

In general, it may be said that the factors contributing toward high land values, directly or indirectly tend to bring about low farm-mortgage interest rates. These factors may be physical, economic, and social; each one or all three classes may be especially important in a particular community.

Physical Factors Affecting Farm-Mortgage Interest Rates

The principal physical determinants of land values and interest rates are climate, soils, and precipitation. Dr. O. E. Baker, of the United States Department of Agriculture, in the *Agricultural*

TABLE II. AVERAGE, MEDIAN, AND MODAL FARM-MORTGAGE INTEREST RATES, BY STATES, 1920

State	Arithmetic Average Rate of Interest (Percentage)	Median Rate of Interest (Percentage)	Modal Rate of Interest (Percentage)
Maine	6.1	6.0	6.0
New Hampshire	5.1	5.0	5.0
Vermont	5.4	5.5	5.0
Massachusetts	5.7	6.0	6.0
Rhode Island	5.8	6.0	6.0
Connecticut	5.7	6.0	6.0
New York	5.4	5.5	6.0
New Jersey	5.4	5.5	6.0
Pennsylvania	5.3	5.5	6.0
Ohio	5.9	6.0	6.0
Indiana	5.8	6.0	6.0
Illinois	5.5	6.0	6.0
Michigan	6.0	6.0	6.0
Wisconsin	5.3	5.5	6.0
Minnesota	5.8	6.0	6.0
Iowa	5.5	5.5	6.0
Missouri	6.1	6.0	6.0
North Dakota	6.7	7.0	6.0
South Dakota	5.9	6.0	6.0
Nebraska	5.7	6.0	6.0
Kansas	6.0	6.0	6.0
Delaware	5.7	6.0	6.0
Maryland	5.6	6.0	6.0
Virginia	5.9	6.0	6.0
West Virginia	5.9	6.0	6.0
North Carolina	6.0	6.0	6.0
South Carolina	7.3	8.0	8.0
Georgia	7.3	8.0	8.0
Florida	7.3	8.0	8.0
Kentucky	6.0	6.0	6.0
Tennessee	6.2	6.0	6.0
Alabama	7.5	8.0	8.0
Mississippi	6.5	6.0	6.0
Arkansas	7.8	8.0	10.0
Louisiana	7.2	8.0	8.0
Oklahoma	6.6	6.0	6.0
Texas	7.3	8.0	8.0
Montana	7.6	8.0	10.0
Idaho	7.3	8.0	8.0
Wyoming	7.7	8.0	8.0
Colorado	6.8	7.0	8.0
New Mexico	7.3	8.0	10.0
Arizona	7.5	8.0	8.0
Utah	7.1	8.0	8.0
Nevada	6.7	7.0	8.0
Washington	6.6	7.0	6.0
Oregon	6.5	6.0	6.0
California	6.6	7.0	7.0

Yearbook for 1921, divides the country for agricultural purposes at the one-hundredth meridian. The divisions to the west of the hundredth meridian extend generally north and south; they are classified according to rainfall and to topography, and the agriculture varies with the altitude and rainfall. To the east of this meridian the divisions usually extend east and west; they are classified largely according to temperature and crops grown, and the agriculture varies with the latitude and the soil.

TABLE III. PERCENTAGE OF OWNER-OPERATED FARMS REPORTED AS MORTGAGED [1]

State	1920	1910	1900	1890
United States	37.2	33.2	30.0	27.8
Maine	28.7	26.5	26.2	21.9
New Hampshire	29.0	25.5	24.7	21.4
Vermont	48.7	46.8	45.8	43.8
Massachusetts	45.0	40.6	37.8	30.3
Rhode Island	29.2	28.9	25.1	18.7
Connecticut	45.4	42.9	40.1	30.6
New York	43.9	43.4	45.2	43.8
New Jersey	46.1	48.9	49.8	48.1
Pennsylvania	31.6	30.9	31.2	27.0
Ohio	28.5	28.6	29.0	28.5
Indiana	37.5	38.3	35.6	32.6
Illinois	38.5	38.4	37.9	36.3
Michigan	49.4	48.0	47.5	48.8
Wisconsin	59.1	51.0	44.9	42.1
Minnesota	52.4	46.0	43.3	45.4
Iowa	54.2	51.2	52.1	52.8
Missouri	46.2	46.0	41.5	35.8
North Dakota	71.1	50.2	30.3	47.9
South Dakota	57.0	37.4	35.3	51.1
Nebraska	50.5	38.9	43.6	51.0
Kansas	45.4	44.3	40.9	55.0
Delaware	33.6	36.6	34.2	28.3
Maryland	34.6	36.2	34.7	29.3
Virginia	17.8	15.8	14.0	3.1
West Virginia	14.2	12.5	13.6	12.7
North Carolina	16.2	18.3	15.2	4.9
South Carolina	21.1	23.3	19.1	8.0
Georgia	22.7	18.5	13.7	3.4
Florida	21.1	14.6	9.7	2.9
Kentucky	22.6	19.4	14.6	4.0
Tennessee	21.8	16.7	11.1	3.2
Alabama	26.0	26.4	18.3	4.3
Mississippi	26.3	32.3	25.8	7.6
Arkansas	30.2	21.0	13.6	4.1
Louisiana	20.6	18.6	16.6	3.9
Oklahoma	50.4	42.2	8.4	....
Texas	34.8	32.7	22.3	5.7
Montana	59.5	20.6	13.4	14.4
Idaho	57.9	33.2	16.0	15.5
Wyoming	41.1	19.7	11.2	12.2
Colorado	46.7	26.0	25.8	24.6
New Mexico	24.3	5.3	2.1	3.0
Arizona	43.0	12.7	5.9	6.4
Utah	43.9	22.7	10.9	5.4
Nevada	32.8	16.6	19.0	16.7
Washington	45.5	33.7	21.4	26.0
Oregon	44.8	33.4	24.5	22.7
California	50.4	40.1	31.3	31.6

[1] Data from 1920 Census.

That weather is an important element in agriculture is well known, but the influence of any one weather factor on yield has only recently been appreciated. In the *Agricultural Yearbook* for 1920, J. Warren Smith, meteorologist for the Weather Bureau, stresses the important influence of individual weather elements on the yields of particular crops.

An extra one-fourth inch of rain at the right time may add thousands of bushels to the corn planter's harvest; a few degrees lower temperature may put a lot of extra money into the potato grower's pocket. The way the wind blows is sometimes more important than the cost of farm labor. Crop yields are controlled by the amount of sunshine, rainfall, and heat received, and all farm operations are fostered or hindered by the prevailing weather.[2]

In his book on *Agricultural Meteorology*, Mr. Smith makes the statement: "There is an optimum combination of temperature, moisture, and sunshine in which plants make their best growth, and under which the largest yields will be obtained." In order to be most effective, these factors must be in correct proportion, although the requisites will vary according to the nature of the crop.

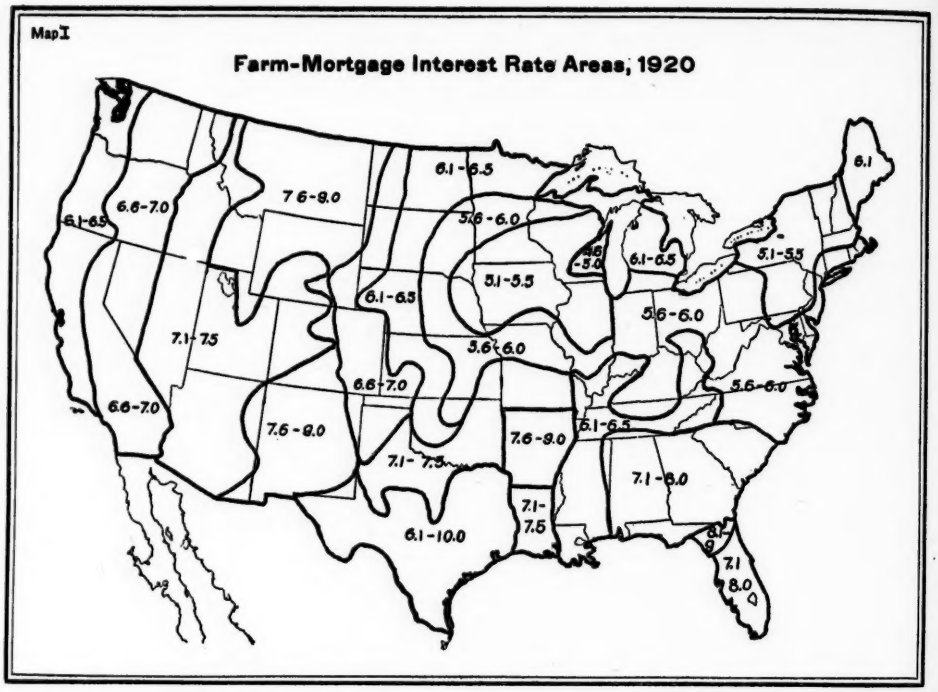
Generally speaking, an annual rainfall of from 20 to 25 inches and a growing season of 120 days are thought to

[2] *Yearbook of the United States Department of Agriculture*, 1920, p. 181.

TABLE IV. FARM-MORTGAGE DEBT, VALUE OF FARMS REPORTING AMOUNT OF DEBT TO VALUE, BY STATES, 1910 AND 1920 [8]

STATE	VALUE OF LAND AND BUILDINGS		AMOUNT OF DEBT		RATIO OF DEBT TO VALUE (PERCENTAGE)	
	1920	1910	1920	1910	1920	1910
United States	$13,775,500,013	$6,330,236,951	$4,003,767,192	$1,726,172,851	29.1	27.3
Maine	58,427,088	39,774,005	18,592,225	11,738,529	31.8	29.5
New Hampshire	20,274,025	15,457,040	6,820,551	4,773,610	33.6	30.9
Vermont	61,070,552	36,858,501	23,575,778	12,436,091	38.6	33.7
Massachusetts	70,745,237	49,742,396	23,412,188	16,371,484	33.1	32.9
Rhode Island	4,864,643	4,087,933	1,494,367	1,356,326	30.7	33.2
Connecticut	55,781,194	37,906,308	17,860,949	11,859,468	32.0	31.3
New York	388,114,245	284,659,163	145,533,268	97,309,848	37.5	34.2
New Jersey	67,175,967	55,507,006	25,122,582	19,476,938	37.4	35.1
Pennsylvania	256,577,347	176,168,359	87,741,155	61,539,433	34.2	34.9
Ohio	387,187,747	220,749,834	121,120,774	63,788,397	31.3	28.9
Indiana	439,152,507	251,961,241	105,256,239	57,486,582	24.0	22.8
Illinois	775,394,589	454,857,222	197,211,841	115,799,646	25.4	25.5
Michigan	420,108,156	250,874,010	144,103,067	75,997,030	34.3	30.3
Wisconsin	937,385,358	427,522,421	354,574,391	146,815,313	37.8	34.3
Minnesota	925,963,060	295,015,775	254,475,222	77,866,283	27.5	26.4
Iowa	1,814,260,136	735,265,320	489,816,739	204,242,722	27.0	27.8
Missouri	752,008,050	389,476,000	216,463,380	112,565,403	28.8	28.9
North Dakota	380,132,941	213,642,953	108,284,682	47,841,586	28.5	22.4
South Dakota	411,837,314	154,749,490	89,875,046	32,771,359	21.8	21.2
Nebraska	705,561,409	286,308,920	168,507,859	62,373,472	23.9	21.8
Kansas	424,469,454	287,082,217	109,914,464	70,819,736	25.9	24.7
Delaware	11,422,387	8,801,976	4,460,416	3,068,721	39.0	34.9
Maryland	75,082,413	44,398,721	27,481,197	15,673,773	36.6	35.3
District of Columbia	237,900	233,400	92,900	56,100	39.1	24.0
Virginia	151,585,109	62,377,247	41,725,542	15,440,291	27.5	24.8
West Virginia	43,989,441	21,549,125	11,205,953	5,592,533	25.5	26.0
North Carolina	103,282,055	42,952,440	31,968,285	9,958,389	31.0	23.2
South Carolina	92,052,935	39,593,747	25,153,227	10,109,072	27.3	25.5
Georgia	124,579,125	37,526,424	37,671,385	10,988,409	30.2	29.3
Florida	50,580,850	12,884,025	12,909,813	2,709,970	25.5	21.0
Kentucky	230,557,435	81,315,441	67,116,481	23,411,430	29.1	28.8
Tennessee	159,000,504	47,232,059	49,836,266	12,626,330	31.3	26.7
Alabama	81,888,501	32,311,461	29,103,101	10,350,577	35.5	32.0
Mississippi	99,148,925	42,266,412	30,046,272	13,381,306	30.3	31.7
Arkansas	129,347,657	35,035,023	38,539,428	8,941,332	29.8	25.5
Louisiana	68,361,653	28,771,635	20,490,966	8,950,301	30.0	31.1
Oklahoma	272,615,622	122,327,300	73,434,422	27,384,765	26.9	22.4
Texas	664,522,579	297,880,832	172,166,818	76,089,272	25.9	25.5
Montana	240,549,778	44,615,154	77,949,679	10,741,280	32.4	24.1
Idaho	223,648,851	64,376,068	69,868,243	14,557,103	31.2	22.6
Wyoming	55,609,834	16,675,387	15,303,106	4,207,983	27.5	25.2
California	211,700,699	77,332,068	62,623,338	18,986,026	29.6	24.6
New Mexico	43,085,327	10,683,233	11,179,034	2,590,282	25.9	24.2
Arizona	50,452,989	8,695,498	15,648,280	2,253,252	31.0	25.9
Utah	84,578,191	21,319,580	24,334,636	4,564,175	28.8	21.4
Nevada	18,280,502	4,297,144	6,518,605	1,464,084	35.7	34.1
Washington	202,018,288	113,394,798	61,120,951	25,644,551	30.3	22.6
Oregon	166,663,433	93,525,449	51,999,178	21,165,627	31.2	22.6
California	764,166,011	250,199,190	224,063,903	60,036,660	29.3	24.0

[8] From 1920 Census.

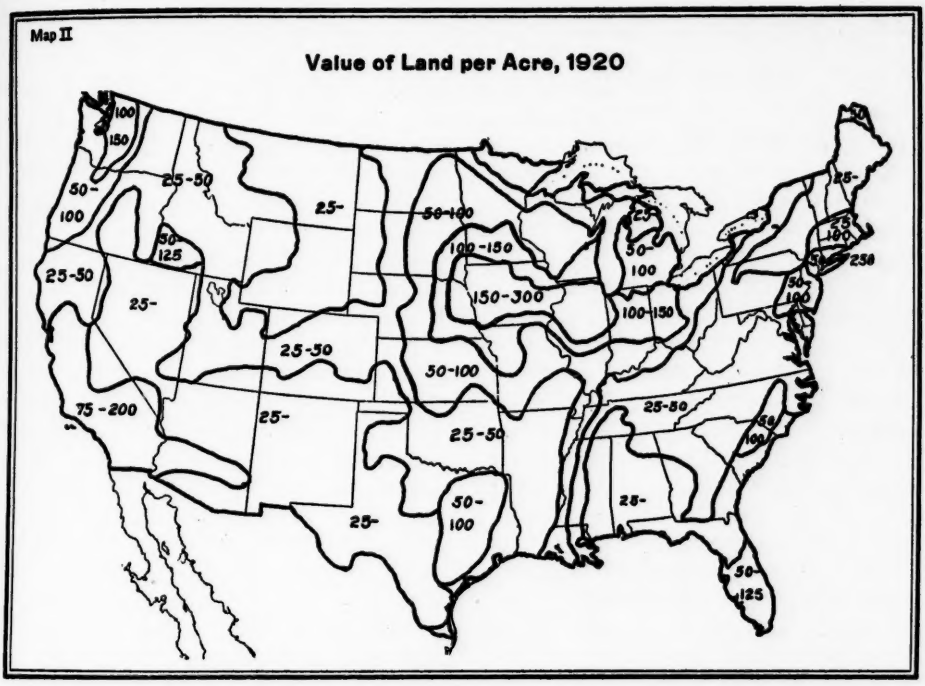


be necessary requirements for a favorable combination of weather conditions. When these requirements are not met, the tendency is for rainfall and growing season to become limiting factors in crop raising.

It will be noted on Map III that east of the Rocky Mountains the distribution of precipitation is comparatively uniform, increasing as one approaches the East. West of the Rockies, however, the amount of precipitation is quite irregular, ranging from 5 inches in southeastern California and southwestern New Mexico, to over 100 inches in northwestern Washington. By referring to the interest rate map and the land value map, a resemblance will be noted in the direction of the contour lines. From the hundredth meridian westward to the point where precipitation again reaches the annual 20-inch mark, the highest interest rates and the lowest land values will be found. Also on Map IV we find that regions with less than 120 days in the growing season correspond to the high interest rate regions.

The number of inches of rainfall *per se* is no indication of the sufficiency of this rainfall. Meteorologists point out that the amount and rapidity of the evaporation greatly determine the efficiency of the rainfall and that "a rainfall of 21 inches in the Texas Panhandle is no better for crops than 15 inches in the upper Great Plains, because the evaporation in Texas is nearly double that in North Dakota." The point is that seasonal distribution is more important than the annual amount of rainfall.

Another very important physical feature influencing land values and farm-mortgage interest rates is the type of soil. By way of illustration, Norfolk



sand is a well-drained, loose-texture soil, found extensively from New Jersey to southern North Carolina and other southern localities. But it is too well drained for general farm crops and hence its use is limited. It is, however, the most valuable soil for early trucking. This special purpose gives it a high land value and a correlatively low interest rate, where other disturbing elements do not enter in. The area in Kentucky where the interest rate is low in comparison with the rest of the state corresponds to the limestone region, where the soil is rich in lime. This quality in the soil makes possible the growth of the famous bluegrass of Kentucky. Muck soils are especially adapted to such vegetables as celery, lettuce, and onions, and they greatly enhance the value of the land; but no correlation with the interest rate is found to exist. This is explained by the fact that these muck lands are not found in extensive areas, and are usually in small patches among other types of soil.

But land values are not necessarily attributable only to existing physical conditions. The fact that the same values do not obtain over certain areas may not be due to a superior quality of the soil or to its inferiority, but rather to other conditions. Available means of transportation, proximity to centers of population, and many other factors effectively influence values and rates.

Economic Factors Affecting Farm-Mortgage Interest Rates

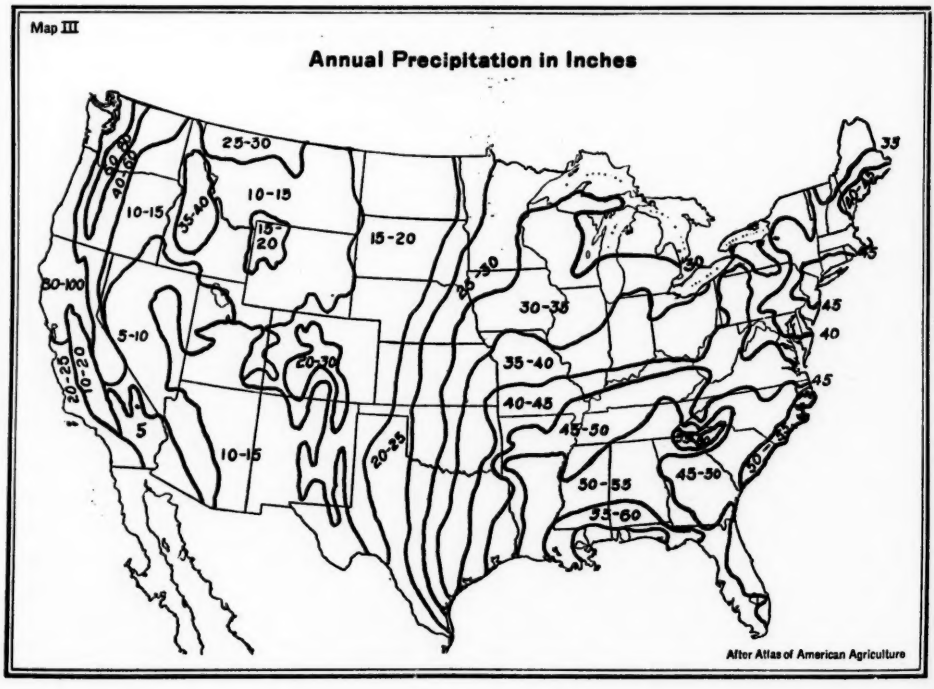
In discussing the economic factors influencing farm-mortgage interest rates, we deal with the most direct determinant, that is, the local funds available for farm mortgages. The extent to which these funds exist naturally varies

inversely with the interest rate. We know that interest rates are determined by the interaction of the demand for, and supply of, money. But we must go back of this formula and ascertain what determines the demand for, and supply of, money in the farm-mortgage field in general, and in certain localities in particular.

The demands for money come largely from those who already are owners and want to buy additional land, or from owners who want to make improvements on their farms. But a demand for money also originates with tenants who desire to take the next step in the agricultural ladder, and with city dwellers who seek a "stake in the land." Also a call for funds comes from those who want to buy land for speculative purposes and from others who want to mortgage their land in order to buy equipment.

The supply of farm-mortgage funds is furnished by those who seek a fairly stable income from a long-time investment which is secure as to principal, is marketable, and requires little attention. The chief sources of these funds are banks, especially state and savings banks, trust companies, mortgage banks, insurance companies, building and loan associations, estates, and individuals. Usually the average amount of the mortgage held by individuals is smaller than that held by some institutions, but the aggregate mortgage funds supplied by individuals represent the largest source of mortgage money. Next in importance are the banks (Table V), then the insurance companies (Table V), mortgage bankers, Federal Farm Loan System, and other agencies.

Based on the assumption that all farms in each state are mortgaged to the same percentage of their value as

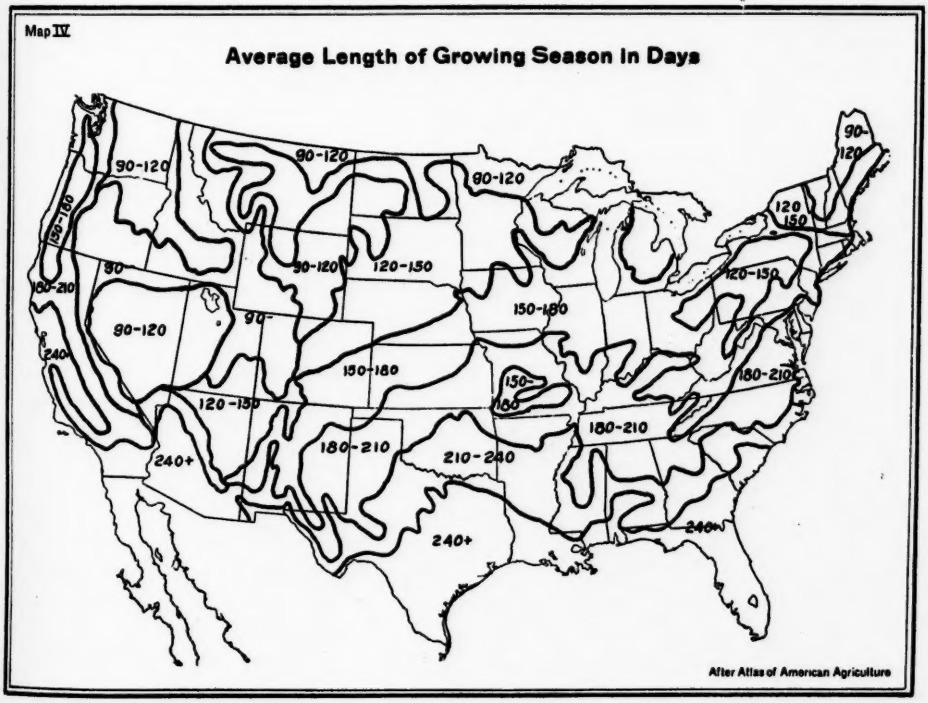


the owner-operated farms, V. N. Valgren, of the United States Department of Agriculture, has estimated the total mortgage debt for 1920 to be $8,500,000,000. On this basis he estimates that 17% of the loans were held by banks and 14% by insurance companies.

The building and loan associations are primarily urban credit institutions, but they are more and more taking care of rural needs. Frequently the extent to which they can assist the farmer is limited by statute providing that loans may not be placed on realty that is located beyond a stipulated distance from the association's place of business. On the other hand, special provision is sometimes made so that the farmer will be able to borrow money from a building and loan association. This is illustrated by the Land Banks of the State of New York, where 10 or more savings and loan associations with aggregate resources of not less than $5,000,000 may organize a Land Bank which is permitted to make rural loans to the extent of 75% of the appraised value of a farm.

The individuals and the banks are the local sources of capital, and the extent to which they are able to meet the demands of the community is very important. If the funds available for farm mortgages in the locality are not sufficient to meet the needs and outside capital must be obtained, the rate charged on this money must necessarily be higher in order to cover costs that otherwise would not be incurred. These increased expenses are due to the distance of the investor from the property which necessitates a field force of appraisers, as well as supervision and other additional overhead expenses.

Local savings, as a rule, reflect the



agricultural conditions of the community, and this explains the inverse correlation between the high land values and low interest rates. The productivity of a region makes possible a surplus which is either lent directly on mortgages or which is deposited in a savings bank and then lent by the bank. The possibility of a surplus of loanable funds is conditioned by the type of productivity; as a general rule, this surplus will be less in localities in which the annual income of producers is received at one time instead of being distributed during the year. For example, certain cotton or wheat lands may be productive, but the crop is harvested during a short period of the year and the income realized may be largely pledged before it is received, thus leaving little or no surplus. But in a well-balanced agricultural section, such as that discussed below, the income is more regular and is more truly indicative of the purchasing and saving power of the farmer. In Table VI the amount of time deposits of the Counties of Wisconsin has been arranged according to the farm-mortgage interest rates charged in those counties. Wisconsin is divided into four sections, and the newer, less developed counties show a smaller amount of time deposits and a higher rate of interest.

Fertile soil and productivity are of little avail unless the crop is placed where it can be consumed. Good roads and adequate railroad facilities are indispensable. In general, a farm more than 20 miles from a railroad is seriously handicapped, and, in cases where vegetables, milk, and the like, are to be marketed, a distance of 15 and even 10 miles from a railroad may be a distinct handicap.

Most states today have highway commissions which are inaugurating extensive programs for road construction. Good roads have always been a necessity, but since the advent of the automobile and motor truck, road-building

TABLE V. ESTIMATED AMOUNT OF FARM MORTGAGES HELD BY BANKS AND INSURANCE COMPANIES, 1920 [4]

State	Farm Mortgages Held by	
	Banks	Insurance Companies
United States	$144,700,000	$121,400,000
Maine	5,400,000	3,200
New Hampshire	8,900,000	
Vermont	65,300,000	4,550
Massachusetts	7,100,000	11,600
Rhode Island	300,000	
Connecticut	6,700,000	1,900,000
New York	24,000,000	300,000
New Jersey	1,000,000	46,966
Pennsylvania	9,100,000	100,000
Ohio	51,900,000	23,300,000
Indiana	78,900,000	70,700,000
Illinois	106,000,000	64,300,000
Michigan	32,600,000	1,600,000
Wisconsin	65,700,000	5,500,000
Minnesota	124,900,000	76,900,000
Iowa	213,300,000	285,700,000
Missouri	75,100,000	97,400,000
North Dakota	27,100,000	28,800,000
South Dakota	22,100,000	59,400,000
Nebraska	35,300,000	91,200,000
Kansas	33,400,000	98,200,000
Delaware	2,000,000	200,000
Maryland	5,600,000	400,000
Virginia	13,500,000	1,200,000
West Virginia	4,300,000	100,000
North Carolina	24,700,000	7,000,000
South Carolina	17,200,000	6,300,000
Georgia	21,200,000	30,100,000
Florida	4,300,000	1,300,000
Kentucky	25,900,000	12,600,000
Tennessee	19,300,000	17,400,000
Alabama	12,600,000	8,900,000
Mississippi	43,300,000	12,800,000
Arkansas	22,200,000	12,900,000
Louisiana	26,700,000	3,000,000
Oklahoma	8,700,000	48,000,000
Texas	15,600,000	90,200,000
Montana	19,300,000	11,400,000
Idaho	6,000,000	9,000,000
Wyoming	7,100,000	800,000
California	6,100,000	3,000,000
New Mexico	1,200,000	3,200,000
Arizona	3,400,000	1,000,000
Utah	9,900,000	1,500,000
Nevada	2,900,000	300,000
Washington	9,300,000	8,400,000
Oregon	5,400,000	5,200,000
California	114,300,000	13,300,000

[4] United States Department of Agriculture, Bulletin No. 1047.

has received even more attention. The effect of good roads on land values is almost axiomatic. Studies are being conducted in different parts of the country by the Bureau of Public Roads, United States Department of Agriculture, to determine the actual relationship between good roads and land values and the extent to which one influences the other.

Where the urban population greatly exceeds the rural population, the farmer will find local markets for his products, and if these markets should be large cities, they will to some degree influence the type and proportion of the crops raised. For example, around New York City, Chicago, Philadelphia, and other centers of population intensive truck gardening is carried on, as well as the production of milk and other dairy products, of poultry, eggs, and the like.

The type of farming practiced involves a risk element which is directly reflected in the interest rate. The high degree of risk in a one-crop system is manifested in a high interest rate. Consequently, the wheat fields of North Dakota and Minnesota and the cotton regions in the southern states have high interest rates. Plants and animals are subject to blights, diseases, or pests—some more than others. The gypsy moth or the corn borer may infest fruits or corn, tuberculosis may attack the live stock. Serious attention should be given to pests and diseases, but where diversified agriculture is practiced, the farmer is not completely ruined should

TABLE VI. TIME DEPOSITS IN WISCONSIN COUNTIES ACCORDING TO MORTGAGE INTEREST RATE GROUPS, 1920

FARM-MORTGAGE INTEREST RATE—LESS THAN 5%		FARM-MORTGAGE INTEREST RATE—5.1—5.5%		FARM-MORTGAGE INTEREST RATE—5.6—6.0%		FARM-MORTGAGE INTEREST RATE—6.1% AND OVER	
County	State and Savings Banks Time Deposits	County	State and Savings Banks Time Deposits	County	State and Savings Banks Time Deposits	County	State and Savings Banks Time Deposits
Calumet	$ 1,414,544	Adams	$ 318,084	Ashland	$ 875,664	Bayfield	$ 595,673
Dodge	5,212,206	Brown	6,003,809	Barron	3,831,165	Burnett	781,829
Fond du Lac	3,347,305	Buffalo	1,795,878	Chippewa	3,664,802	Douglas	2,330,136
Green Lake	1,488,620	Columbia	4,111,913	Clark	2,977,895	Florence	195,858
Jefferson	3,341,604	Dane	10,396,739	Crawford	2,560,402	Forest	232,165
Kewanee	5,064,770	Door	2,884,487	Langlade	408,293	Iron	431,724
Manitowoc	6,031,028	Dunn	3,213,459	Lincoln	2,071,738	Oneida	768,854
Marquette	57,109	Eau Claire	2,989,696	Marathon	4,314,117	Price	957,986
Milwaukee	58,805,612	Grant	7,250,923	Marinette	1,294,252	Rusk	1,097,694
Ozaukee	2,189,395	Green	1,042,296	Oconto	1,303,328	Sawyer	207,738
Sheboygan	7,235,125	Iowa	2,797,889	Pierce	3,490,232	Washburn	1,329,784
Washington	3,483,561	Jackson	2,135,012	Polk	3,574,858		
Waukesha	4,092,260	Juneau	4,441,115	Portage	2,429,198		
Winnebago	5,793,084	Kenosha	2,212,851	Richland	1,936,782		
		LaCrosse	4,383,838	St. Croix	2,802,103		
		LaFayette	346,434	Taylor	221,835		
		Monroe	5,312,583	Trempeleau	6,457,041		
		Outagamie	4,055,953	Vernon	3,905,899		
		Pepin	755,647	Vilas	210,039		
		Racine	4,343,559	Wood	1,555,684		
		Rock	8,370,778				
		Sauk	6,981,109				
		Shawano	3,012,901				
		Walworth	3,129,797				
		Waupaca	3,559,525				
		Waushara	1,746,383				

one of his crops be injured, for he has other crops to rely upon. But the effects of the activities of the wheat rust in the wheat regions and of the boll-weevil in the cotton states are well known. Some of the states, realizing the danger of these hazards, have encouraged diversified farming, so that today we find Alabama and Georgia producing less cotton and having more diversification. W. J. Spillman, in Farmers Bulletin Number 1289, United States Department of Agriculture, states that different kinds of live stock have been introduced in south central Alabama, and that there has been a great reduction in cotton production, which is illustrated by the following percentages of reduction.

Montgomery County	68%
Coosa and Pike Counties	62
Lowndes County	59
Bullock County	56
Wilcox County	51
Marengo and Greene Counties	50

Fruit is a specialized crop which depends largely upon the adaptability of the soil to the particular type of tree. Moreover, orcharding is especially subject to hazards of climate, rainfall, and insect pests.

Taking 50 leading agricultural counties of the United States ranked according to the value of their crops and live stock products, the relationship of the nature of agriculture to the interest rate can be illustrated (Table VIII). Those counties whose high crop value is due primarily to fruit, cotton, and wheat may have land values above the average values for the state, but the interest rates are higher than the average for the state. On the other hand, the counties whose high crop values are in dairy products, hay, corn, eggs, and chickens do not necessarily have high land values, but the farm-mortgage interest rates are below the average rate for the state.

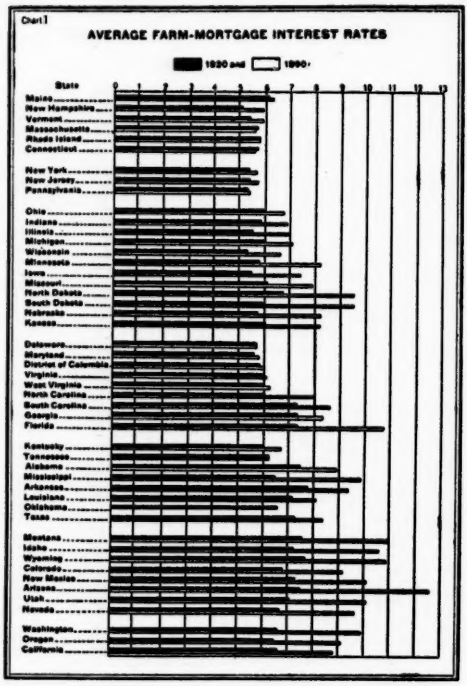
TABLE VII. PERCENTAGE OF URBAN AND RURAL POPULATION AND INCORPORATED PLACES OF 2,500 AND OVER, BY STATES, 1920

State	Urban	Rural	Incorporated Places of 2,500 and Over
United States	51.4	48.6	2799
Maine	39.0	61.0	25
New Hampshire	63.1	36.9	27
Vermont	31.2	68.8	14
Massachusetts	94.8	5.2	169
Rhode Island	97.5	2.5	27
Connecticut	67.8	32.2	30
New York	82.7	17.3	169
New Jersey	78.4	21.6	121
Pennsylvania	64.3	35.7	314
Ohio	63.8	36.2	148
Indiana	50.6	49.4	93
Illinois	67.9	32.1	171
Michigan	61.1	38.9	93
Wisconsin	47.3	52.7	82
Minnesota	44.1	55.9	59
Iowa	36.4	63.6	81
Missouri	46.6	53.4	63
North Dakota	13.6	86.4	12
South Dakota	16.0	84.0	14
Nebraska	31.3	68.7	31
Kansas	34.9	65.1	62
Delaware	54.2	45.8	4
Maryland	60.0	40.0	18
Virginia	29.2	70.8	39
West Virginia	25.2	74.8	35
North Carolina	19.2	80.8	55
South Carolina	17.5	82.5	32
Georgia	25.1	74.9	59
Florida	36.7	63.3	30
Kentucky	26.2	73.8	51
Tennessee	26.1	73.9	47
Alabama	21.7	78.3	39
Mississippi	13.4	86.6	32
Arkansas	16.6	83.4	41
Louisiana	34.9	65.1	38
Oklahoma	26.6	73.4	63
Texas	32.4	67.6	119
Montana	31.3	68.7	17
Idaho	27.6	72.4	20
Wyoming	29.5	70.5	8
Colorado	48.2	51.8	26
New Mexico	18.0	82.0	12
Arizona	35.2	64.8	15
Utah	48.0	52.0	17
Nevada	19.7	80.3	2
Washington	55.2	44.8	35
Oregon	49.9	50.1	33
California	68.0	32.0	107

In all loans the character of the individual desiring the loan is of great importance. Where the transaction is made directly between borrower and lender, the latter will make inquiry as to the character of the borrower. But

TABLE VIII. FIFTY LEADING COUNTIES ACCORDING TO VALUE OF CROPS AND LIVE STOCK PRODUCTS, VALUE PER ACRE, AND MORTGAGE INTEREST RATE, 1920

County and State	Value of Crops and Live Stock Products		Value per Acre, Land Only	Average Farm-Mortgage Interest Rate
	Rank	Amount		
Los Angeles, Cal.	1	$71,579,899	$386	6.7
Fresno, Cal.	2	55,110,100	197	6.8
Aroostook, Me.	3	54,376,256	50	6.3
San Joaquin, Cal.	4	41,191,240	170	6.2
Lancaster, Pa.	5	40,776,212	92	4.6
Yakima, Wash.	6	34,741,710	143	6.8
Tulare, Cal.	7	34,036,167	154	6.7
Sonoma, Cal.	8	32,300,623	109	6.1
Whitman, Wash.	9	31,921,047	92	6.3
Dane, Wis.	10	29,395,753	115	5.1
McLean, Ill.	11	29,161,454	322	5.4
San Bernardino, Cal.	12	27,957,448	200	6.8
Maricopa, Ariz.	13	26,819,662	105	7.6
St. Lawrence, N. Y.	14	26,809,540	28	5.1
Orange, Cal.	15	26,635,748	221	6.6
York, Pa.	16	26,600,746	46	5.1
Santa Clara, Cal.	17	26,135,980	214	6.1
La Salle, Ill.	18	25,828,420	267	5.2
Champaign, Ill.	19	25,619,290	339	5.3
Livingston, Ill.	20	24,153,905	313	5.4
Bolivar, Miss.	21	23,703,571	192	7.1
Iroquois, Ill.	22	23,627,284	244	5.2
Anderson, S. C.	23	23,528,158	111	7.0
Orangeburg, S. C.	24	23,427,879	63	7.5
Robeson, N. C.	25	23,389,828	69	5.9
Weld, Colo.	26	23,203,475	57	6.5
Dodge, Wis.	27	23,049,660	122	4.8
Stanislaus, Cal.	28	22,758,641	114	6.5
Hartford, Conn.	29	22,751,488	89	5.8
Williamson, Tex.	30	22,324,436	82	7.2
Chautauqua, N. Y.	31	22,316,250	43	5.6
Chester, Pa.	32	22,261,956	60	5.2
Sacramento, Cal.	33	21,981,958	180	6.4
Pitt, N. C.	34	21,486,117	38	6.0
Otter Tail, Minn.	35	21,474,949	64	6.1
Berks, Pa.	36	21,447,279	36	5.1
Erie, N. Y.	37	21,294,818	66	5.5
Spartanburg, S. C.	38	20,887,542	101	7.4
Ellis, Tex.	39	20,375,681	164	7.3
Riverside, Cal.	40	20,253,304	119	6.9
Imperial, Cal.	41	20,195,367	158	7.2
Fannin, Tex.	42	20,163,821	112	7.6
Steuben, N. Y.	43	19,938,904	20	5.5
Jefferson, N. Y.	44	19,918,631	31	5.3
Johnston, N. C.	45	19,812,510	72	6.0
Delaware, N. Y.	46	19,832,943	17	5.2
Marlboro, S. C.	47	19,419,921	195	7.7
Onondago, N. Y.	48	19,395,595	50	5.5
Lamar, Tex.	49	19,305,636	96	7.7
Ventura, Cal.	50	19,160,414	482	6.5



where the loan is made by a large concern or by some distant investor, the character of the individual may not be so easy to ascertain, and the investor will be guided by the qualities usually attributed to the type of people farming in the region where the loan is to be made. Certain nationalities are known for their thrift and diligence; others for their improvidence. These characteristics may affect the supply of money for mortgages and the interest rates in several ways. Improvident, careless types will find the supply of funds limited and the rates high. Thrifty farmers will experience less difficulty in getting loans, and at the same time their thrift will perhaps enable sufficient local accumulations to provide for the mortgage needs of the community. The competition between local and outside capital tends to bring down the interest rate.

The buying habits and buying willingness of the farmer and the manner in which he improves his farm are indications of his personal habits.

Table IX shows that automobiles, telephones, and similar expenditures are most common in the Corn Belt and other states where the per capita rural wealth is high. There does not seem to be, however, any relationship between per capita wealth and water piped into the house. Of course, in some sections of the country where the economic size of the farm is large and farms are far apart, telephones and automobiles are almost necessities, and it may even be that the automobile is partly responsible for the mortgage on the farm. Unless the auto were used to facilitate farm business, it would not contribute toward the farm income, and should be financed with the understanding that the loan was for a consumption purpose.

A word must be said about legislation and the farm-mortgage interest rate. Legal limitations of the interest rate vary in the different states, although the statutory rates are frequently evaded by means of extra commissions and fees. But the variations of the legal rates may give some states an advantage over others. An attempt to equalize the interest rate on farm mortgages is made through the Federal Farm Loan System.

In the states where land is excessively taxed, a large part of the income is taken by the state. This makes it more difficult to pay the loan off out of the income, and the investment then becomes undesirable. This would limit the amount that people are willing to lend on mortgages and the rate consequently rises. When we have double taxation, both the land and the mortgage being taxed, investment in mortgages tends to be discouraged. Recent-

ly the National Association of Real Estate Boards made a survey of the state mortgage tax laws. It was found that in 15 states the land only is taxed, in 10 states there is double taxation, and in other states different methods are used. It was also found that in the 10 double-taxation states the law taxing the mortgage is frequently not enforced. Connecticut has an unpopular excess mortgage tax law which provides for a tax on the amount of the mortgage exceeding the assessed value of the property. This law, however, is not enforced. In Mississippi and Vermont land contracts and mortgages are not taxable if the interest they bear is less than the legal rate, 6% in Mississippi and 5% in Vermont. If they bear a higher rate of interest than this, they are taxable. In some states, as Oregon and California, mortgages on real estate within the state are exempt from taxation.

In conclusion, it may be said that the idea of this survey is not to prejudice investors in farm mortgages in favor of one section of the country at the expense of another. Rather it is an attempt to show why individuals or institutions do as they do. It is an attempt to explain the predominating factor or factors that most affect the interest rate in the different parts of the United States. Eastern Wisconsin has the lowest interest rate in the United States because agriculture is diversified, and because it is a great dairy region largely farmed by a thrifty German and Scandinavian population. The savings are sufficient to make it possible for one farmer to lend to another, thus avoiding all such extra expenses as overhead and appraisal. These farmers would rather lend their money at 4% to neighbors where they may view every day the security of the investment, than buy first-mortgage bonds at 6% on property in some other part of the country. Almost one-half of the farm mortgages in Wisconsin had an interest rate of 5% or less, those above this rate being in the western and northern cut-over regions of the state.

The Everglades region of Florida presents a contrast. The rate here is higher than that of the surrounding territory, and the cause is found in the limited supply of money for this land. It has only recently been taken over for agricultural purposes, and, since it is newly settled, a great deal of draining,

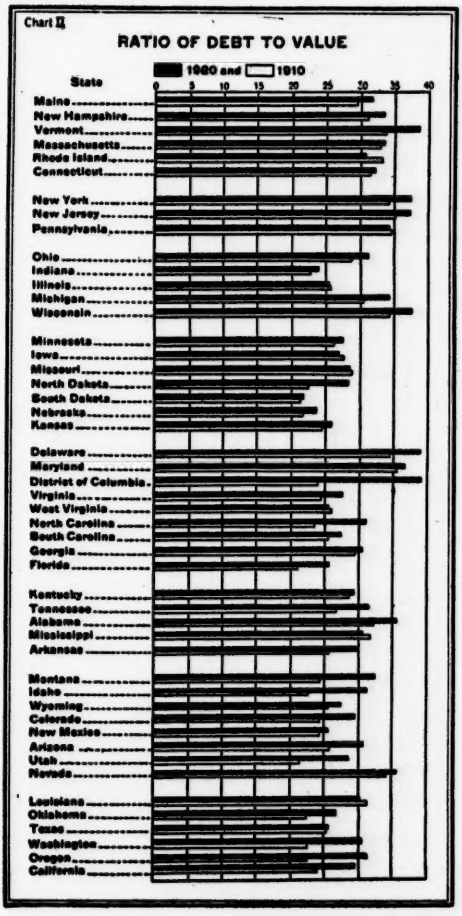


TABLE IX. PERCENTAGE OF ALL FARMS REPORTING MOTOR VEHICLES, TELEPHONES, LIGHT AND WATER, ON FARMS, BY STATES, 1920 [5]

State	Automobiles	Motor Trucks	Telephones	Gas and Electric Light	Water Piped into House
United States	30.7	2.0	38.7	7.0	10.0
Maine	24.2	2.2	49.0	9.6	37.4
New Hampshire	23.4	3.2	49.5	11.3	52.5
Vermont	26.2	2.0	57.6	11.4	62.9
Massachusetts	25.6	9.8	51.7	28.3	52.8
Rhode Island	29.3	11.5	41.3	17.1	35.5
Connecticut	30.0	6.1	51.8	17.5	42.0
New York	35.2	4.5	47.6	12.9	23.5
New Jersey	39.5	10.4	31.9	15.3	23.7
Pennsylvania	34.5	4.3	43.5	15.2	22.9
Ohio	46.6	2.7	62.1	14.7	16.2
Indiana	46.4	1.7	66.4	10.0	11.4
Illinois	52.9	2.5	73.2	9.8	11.2
Michigan	40.2	2.4	49.8	8.0	15.1
Wisconsin	49.6	2.1	59.1	8.8	7.1
Minnesota	57.1	2.1	62.0	7.6	6.4
Iowa	73.1	4.1	86.1	15.3	15.9
Missouri	30.9	1.9	62.2	5.5	4.5
North Dakota	56.6	1.0	46.8	5.8	6.0
South Dakota	69.4	5.7	59.4	8.6	12.3
Nebraska	75.6	5.1	76.4	9.7	16.6
Kansas	62.0	2.3	77.9	8.7	9.3
Delaware	36.4	2.8	27.2	3.9	7.4
Maryland	33.5	5.3	24.5	7.0	14.0
Virginia	15.3	1.3	18.0	4.2	5.1
West Virginia	11.9	1.0	43.3	14.8	5.7
North Carolina	15.5	0.9	12.2	2.9	1.6
South Carolina	15.9	0.8	5.7	2.7	1.8
Georgia	15.2	0.9	9.6	1.9	1.8
Florida	16.2	2.8	8.4	3.8	6.2
Kentucky	10.5	0.5	27.0	2.2	1.9
Tennessee	8.9	0.5	22.5	1.8	1.9
Alabama	6.2	0.4	15.0	3.3	1.2
Mississippi	5.5	0.3	10.4	1.1	1.1
Arkansas	6.6	0.4	22.7	1.1	0.8
Louisiana	7.0	0.6	6.3	1.1	1.6
Oklahoma	25.5	1.1	37.3	3.7	3.5
Texas	22.9	1.2	32.2	1.9	8.8
Montana	36.0	2.0	17.0	3.5	5.3
Idaho	39.5	1.9	32.9	14.2	12.4
Wyoming	39.2	3.5	28.3	4.6	6.6
California	47.3	4.8	36.7	6.5	11.4
New Mexico	18.6	1.8	11.3	1.4	4.9
Arizona	45.5	5.3	16.4	5.9	19.9
Utah	32.1	2.1	24.5	43.4	24.1
Nevada	45.4	5.1	35.5	12.2	18.3
Washington	41.7	4.8	42.2	13.8	28.6
Oregon	41.0	3.4	40.5	10.9	25.7
California	53.1	5.0	31.7	25.9	56.0

[5] From 1920 Census.

development of transportation facilities and other preparatory work needs to be done in order to make the land good security for loans.

One illustration after another might be cited. In one place the interest rate is low because of diversified agriculture; in another it is high because of the risk involved in raising a specialized crop; in still another place the interest rate is high due to a combination of insufficient rainfall and high altitude, or to distance from markets. The investor in placing his money should make a study of the locality under consideration and decide to what extent he is willing to forego some of the increased return for a secure investment.

DEPARTMENTS

The departments of the JOURNAL are edited specifically with regard to their interest to the readers who are especially concerned with the economic problems of land and public utilities. For the most part the material for the departments will be prepared by members of the staff of the Institute for Research in Land Economics and Public Utilities.

* * *

BOOK REVIEWS

This department contains critical reviews and brief notices of new books of interest to the readers of the JOURNAL.

L. C. GRAY, "Introduction to Agricultural Economics" *B. H. Hibbard* 119

W. H. MALTBIE, "Theory and Practice of Public Utility Valuation" ..... *M. G. Glaeser* 121

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SUMMARIES OF RESEARCH

In this department of this number are given accounts of investigations in progress. Statements of tentative conclusions reached in the course of work by the staff of the Institute and those associated with them in their work will be presented in this department in subsequent issues.

Research Projects of the Institute for Research in Land Economics and Public Utilities 124

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COMMENTS ON LEGISLATION AND COURT DECISIONS

Here the readers of the JOURNAL will find a department devoted to a miscellany of summaries, interpretations, and notices of recent legislation and court decisions that have economic significance in a consideration of land and public utility problems.

The Clarke Forestry Law ..... *M. C. Calkins* 126

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RESEARCH STAFF OF THE INSTITUTE

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HENRY STRONG RESEARCH FELLOWS

MARCUS WHITMAN ROSALIND TOUGH

BOOK REVIEWS

Gray, L. C. INTRODUCTION TO AGRICULTURAL ECONOMICS. *New York: Macmillan Company, 1924. XII, 566 pp. $3.50*

UNTIL there are appreciably more text-books on agricultural economics than have yet appeared, a new one is bound to attract attention. This book by Dr. L. C. Gray will be noticed not alone because books in this field are scarce but because of genuine merits both with respect to the subject-matter included and the manner in which it is handled.

Very logically the author begins with a discussion of the nature and scope of the subject-matter involved in the book. While there may be a difference of opinion as to the merits of this, or any other chapter on the subject, it will undoubtedly strike a great number of students of agricultural economics as the best statement thus far made. It is neither too long nor too short, and, what is of more importance, it defines agricultural economics in terms of economics without dragging in an attempted picture of the ways and means by which economic and other phases of agriculture combine. They have combined for many years, will continue to do so, and the agricultural economist undertakes to discuss the relationships to which the combination leads. The author states clearly and simply that agricultural economics is a branch of economics. The logic of the case is incontrovertible. Whatever definition of agricultural economics is finally evolved it seems clear that it must in the main resolve itself into some simple recognition of the fact that agricultural economics is economics.

In the second part of Chapter I, which is a discussion of the scope of agricultural economics, it may not be so patent that there is an inevitable agreement with the author's views. He says that agricultural economics must begin with the individual farm. No doubt there must be some knowledge of the individual farms available, but it might happen that an approach could be made to some of the most vital subject-matter through the more general aspects of the industry rather than through a study of the economics of the individual farm such as is made under the title "Farm Management."

In accordance with the view as stated by Dr. Gray, that a study of the individual farm in its economic setting is the best approach to agricultural economics, Chapters III to XII, with one exception, deal with farm management, as that term is usually understood. Apparently the author believes that in order to understand the more general phases of the economics of agriculture it is best to gain an understanding of the details of farm economics, or the economics involved in the immediate work of running a farm. On this there is room for a difference of opinion. A resourceful teacher will succeed with almost any sort of text, or with none, but in the hands of a teacher not too well acquainted with the subject-matter the arrangement is of real importance. It is doubtful that the majority of agricultural economists of the country will be pleased to find in the early chapters of the book a discussion of the Financial Analysis of the Farm Business or of Farm Records and Accounts. Whether these chapters belong anywhere in an introductory course in agri-

cultural economics depends mainly on the number of courses offered within the whole field.

Agricultural economics in its larger setting is treated in Chapters XIII to XVIII inclusive, together with Chapter X, the latter dealing with the proportioning of the factors of production. Rather curiously the author puts the discussion of the proportioning of factors among the farm management chapters. Naturally this subject can be introduced into farm management discussion, as can any other phase of economics; witness the writings designated "Farm Management." It might appear more logical to follow, than to precede, the main treatment of the factors of production involved in the proportioning process by the generalizations involved in the theory and practice of proportioning. The arrangement as given by Dr. Gray is made no doubt on the assumption that students will be sufficiently acquainted with land, labor, and capital to enable them to grasp the reasoning involved in the proportioning problem before studying the chapter on the nature, supply, and grades of land, and similar subjects under the headings, Labor and Capital. No doubt it can be done either way, but the arrangement in the book seems less logical than the other way around. In passing it may be noted that Dr. Gray apparently appreciates the difficulties involved in a discussion of the proportioning of the factors and stays, for the most part, on safe ground. One may, however, very properly ask for a further explanation of the assertion: "If the use of the land could be obtained without the payment of rent, the only expense would be for labor (for the purpose of illustration only the two factors are at present considered). Hence it would pay to use that proportion of labor which would yield the largest average product per unit of labor—that is, per dollar of expense."[1] The statement in italics on the preceding page (152) would seem to the reviewer true enough but subject to careful interpretation. For example, how is the total amount to be expended determined? Is the proportion determined separately from the decision as to the size of the whole unit? The inference is that it is not. The passage reads: "The farmer should adopt that proportion of the factors which will yield a maximum return per dollar of total expenditures for any fiscal period." The return per unit is not the vital question, but in the passage on page 153 there is danger that such will be the inference. It is not clear that the two statements harmonize.

Probably the best part of the book from the standpoint of the special students of agricultural economics is found in the three chapters devoted to land. The discussion in these chapters is both clear and analytical and within the grasp of the beginning student for whose use the book is designed. Moreover, these chapters go much farther with the questions involved in land as related to agriculture than has been done in other similar texts, an innovation greatly to be commended. The chapter on land policies is about the first to appear in an elementary text on agricultural economics, and marks a distinct advance, since the desirability of such a discussion in this connection is not open to question.

The chapter on capital and credit and the one on labor are excellent. Probably the author could easily have expanded each of these chapters into two. Had he done so and substituted them, that is the space occupied by them, for

[1] Page 153.

one or two of the technical chapters in the early part of the book it is likely that the larger number of those interested would have been better pleased.

The last part, almost a quarter of the book, deals with marketing. The approach to the marketing discussion is by way of a description of the marketing processes as illustrated by some half-dozen commodities. Then follows a discussion of the principles and functions of a market. This is one of the accepted methods, viewed pedagogically. Another method is to reverse the process, giving the general theory first, while still another attempts to treat both simultaneously. Those who believe, for example, that economic theory should be the last study in economics taken by the undergraduate will agree that Dr. Gray's arrangement is the best. Since it is all within a given course it probably may be handled one way about as well as the other. The more important consideration is whether or not a beginning course should include such a large portion of what, in a very large number of schools, is handled separately. Where no separate course is given in marketing, the amount of space here allotted to marketing will not appear excessive. Where marketing courses are given it will undoubtedly be wise to expand some other parts of the book and give less attention to the discussion of marketing as here presented.

An outstanding feature of the book is the careful lists of questions and problems at the close of each chapter. The chapter references are discriminating, and altogether make a good workable bibliography.

The general tone of the book is conservative, but at the same time is not colorless. If it seems not to go into moot questions, the explanation no doubt is that the book is intended for beginners. It would seem that such a subject as the "control of price through control of production" might, however, very properly leave with the student a little more evidence than is given, or at least testimony as to its applicability to agriculture and, for example, to anthracite coal, or steel, as illustrative of its importance under varying circumstances.

The criticisms here offered should not be taken as an indication that the reviewer wishes to suggest that the faults of the book to any considerable degree outweigh its excellence. The fact is that no standard form of presentation has been worked out and accepted as ideal within this field, to such an extent, for example, as is the case with text-books of general economics. As a result, every attempt will be subjected to critical examination especially with respect to subject-matter and arrangement. Dr. Gray's book in many ways marks a distinct advance. While some might prefer a different sequence of chapters, an expansion of some topics, and a contraction of others, it should be kept in mind that these are details, however important, and that the scholarly tone, logical discussion, and open-mindedness evident throughout the book make it a usable and welcome contribution.

BENJAMIN H. HIBBARD

Maltbie, W. H. THEORY AND PRACTICE OF PUBLIC UTILITY VALUATION. *New York: McGraw-Hill Book Company, 1924. XIX, 195 pp.....$2.00*

In this little volume of less than 200 pages, the author, who is a practicing attorney and consultant in public utility matters, aims to summarize the essentials of public utility valuation. Because the work flows out of the author's own experience with, and participation in,

valuation controversies, one gains an impression of freshness and concreteness in reading the book, a quality not altogether prominent in other recent treatments of the subject that have come to this reviewer's attention. It is, of course, impossible to do justice to a work dealing with so intricate a problem. Some of its good points will have to go unnoticed as well as some defects of detail. It is a readable work and the author has wisely refrained from going into the minutiae of appraisal practice.

The author accomplishes what he set out to do, namely, to give a summary of the essentials of his subject. Like many other works, however, bearing upon the same theme the development of the subject represents a marshaling of the more or less standardized practices obtaining in work of this character. If the reviewer mistakes not the meaning of the word "theory" as used in the title, he finds no comprehensive development of the theoretical aspect of the problem. Nevertheless, there is a good deal of acute reasoning tucked away, here and there, in the pages of this work. The book commends itself to the student who wants a fuller treatment than an ordinary text-book can give.

At the outset the author calls attention to the variation in treatment which the subject has sustained depending upon whether the property appraised was constructed by a corporation organized since commission regulation became effective or whether the inception and development of the property came earlier. He points out the difficulties very nicely, and senses the problem contained in the distinction. To it he attributes the reason why "no definite rule for valuation has been laid down by the courts of last resort."

There follows in successive chapters a treatment of the meaning of the various factors which commissions, following the so-called rule in the leading case of Smythe *vs.* Ames, are required to take into account as evidentiary facts. The author makes much of this distinction between an evidentiary fact of value and the final determination of value by a commission and its approval by the courts. That is undoubtedly the routine in value determinations.

One would indeed be bold to assert that the author has succeeded in extracting the meaning that is everywhere given to original cost, capitalization, market value of securities outstanding, and cost of reproduction new. The heterogeneity that valuation practices have attained makes any attempt at an orthodox summary a hazardous undertaking. Yet in the reviewer's judgment the summary is well done. The author appears to lean to the cost-of-reproduction factor as the one which should be accorded most weight. Accordingly he explains in greater detail the problems met in determining the cost of reproduction new for land, water-power, private rights of way and easements, pavement, and the other types of tangible property. In this connection he brings out many of the imponderables that make appraisal work difficult as a matter of technique and baffling in the attempt to reduce the subject-matter to a few statements of principles. Again and again the author must seek refuge in the facts of the particular case or the exercise of a sound discretion by some one. The problem represented by such terms as unit prices, overhead charges, working capital are, of course, touched upon.

The author carries his ideas of the need of a determination of evidentiary facts as stepping-stones to the conclu-

sive "finding" of value into the field of the so-called intangibles, where he discusses going value, contracts, and franchises. He next takes up the problem represented by superseded property, property neither used nor useful for the public service, deductions for improperly depleted reserves.

This brings him to a discussion of the problem of depreciation and its relation to value determinations—a perplexing but important problem. After explaining what depreciation is, he proceeds to a discussion of the various schemes for measuring and financing depreciation, in the course of which he develops the thesis, associated with Mr. Allison, that in dynamic properties which have attained a considerable age, the accrued depreciation settles down to a normal amount. In fact, the largest portion of the book is devoted to depreciation and its allied problems. The treatment of these materials is made valuable by bringing into it numerous useful classifications which have been developed by appraisers in the course of time. We may perhaps state his general conclusion on the moot problem of the treatment of accrued depreciation in valuations for rate-making. It is that "there should be no deduction from invested value on account of a shortage of depreciation reserve, except in those cases where the history of the utility shows such a failure in duty to the public as justifies the creation of a reserve by the confiscation of a part of the property of the present-day owners."

In a chapter reviewing outstanding court decisions in which the value problem was discussed, he concludes that, properly understood and interpreted, the courts have only sanctioned the deduction of depreciation traceable to decrepitude and deferred maintenance.

He returns then to the main subject, the final determination of value. It is treated under the heading of "Present Value." The conclusion is summed up in the following: "1. The regulatory body desiring to fix a rate base must determine the fair value as of the time of the fixing of the rate. 2. In determining such present fair value it must consider and give actual weight to original cost and reproduction cost of existing plant at current prices. 3. No rule is laid down as to the relative weight of these two evidences of value, and if the regulatory body has given actual weight to each, the court will be slow to change this weight and thereby modify the rate base."

As a statement of the pass to which we have come in our treatment of the valuation problem, this reviewer believes that the above summary is demonstrably correct. It is, however, a sad commentary upon the progress we are making in this field of applied economics. We are indebted to Mr. Maltbie for a brief summary of the existing state of confusion.

The principal criticism that may be directed against the author's treatment of the subject-matter is that it uncritically accepts the ideas lying back of the phraseology of court decisions and operates with these phrases as if they were revelation. No progress will be made until the community of informed opinion resolutely attacks the deeper-lying theoretical problem and ceases to take pronouncements of our overburdened courts as the final oracle of wisdom.

MARTIN G. GLAESER

SUMMARIES OF RESEARCH

RESEARCH PROJECTS OF THE INSTITUTE FOR RESEARCH IN LAND ECONOMICS AND PUBLIC UTILITIES

THIS department of the JOURNAL will carry summaries of research, announcements of new research undertakings, of projects completed, and, from time to time, statements of tentative conclusions reached in the course of work by the staff of the Institute and those associated with them in their work.

The following summary of research in progress is presented in outline form in this first issue of the JOURNAL in order to acquaint the readers at once with the scope and character of the work which the Institute is undertaking to do.

I

Research in land and public utility economics deals with certain underlying economic institutions and forces which pervade the entire field. Consequently the study of these institutions and forces is in a sense preliminary and certainly fundamental to a scientific study of the specific problems in the field. Furthermore, research in specific problems throws light upon these basic institutions and forces. Principles of public utility economics, for example, are formulated with regard for the results of applying public authority to the special relationships, rights, and duties that go with private property "devoted to a public use." Hence, knowledge of the nature, significance, evolution, and operation of economic institutions and forces is indispensable to research that goes to the root of land and public utility problems.

ECONOMIC INSTITUTIONS

A. Economic institutions
   1. History of economic institutions
   2. Economic significance of
      (*a*) Landed property and public utility property
      (*b*) Contract

B. Economic forces
   1. Competition
   2. Custom
   3. Monopoly
   4. Public authority

II

LAND

A. General land economics
   1. Outlines of land economics
   2. Land income
   3. Land policies
   4. Comparative public land policies
   5. Land taxation
   6. The public leasehold in the United States
   7. History of land systems
   8. Recreational lands

B. Agricultural land economics
   1. Outlines of agricultural land economics
   2. Farm tenure and tenancy
   3. Farm land values and valuation
   4. History of federal land policies
   5. Farm mortgage interest rates
   6. Taxation of farm lands

C. Urban land economics
   1. Elements of urban land economics
   2. Urban land tenure and tenancy
   3. The growth and development of cities
   4. Progress of city planning legislation in the United States
   5. Population and urban land values
   6. Urban land utilization
   7. Rent regulation
   8. Building and loan associations

9. Real estate merchandising
10. Taxation of urban realty

D. Forest and mineral lands and water rights
   1. Economics of forest land utilization
   2. Economics of mineral land utilization
   3. Economics of water-power

III

Public Utilities

A. General public utility economics
   1. Elements of public utility economics
   2. Surveys of public utilities in specific localities—Milwaukee, Los Angeles
   3. Taxation of public utilities
      (*a*) Interstate public utilities
      (*b*) Intrastate public utilities
   4. Taxation of public utilities in Wisconsin
   5. Public utility credit
   6. The economics of motor-bus operation as contrasted with the urban electric railway

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COMMENTS ON LEGISLATION AND COURT DECISIONS

THE CLARKE FORESTRY LAW

OUR national forest policy entered a new stage of development when Congress enacted the Clarke bill, popularly known as the McNary-Clarke bill, toward the close of the last session.

The new law embodies the principle of federal cooperation with the states as did the Snell bill which failed to pass Congress in 1921 and 1922. It differs greatly from the more regulatory Capper bill of 1921 in that its emphasis is on the growth of new forests rather than on the sparing of the old ones. The Capper bill was mandatory; the Clarke law is enabling. However, it may be noted in passing that the operation of the new law is severely restricted by the failure of Congress to make the necessary appropriation.

The Clarke law marks the end of five years of animated dissension. It is based largely upon hearings before a select Senate committee on reforestation; the hearings were held in all the important timber-growing states. Although the law, as passed, is compromise legislation, it is receiving practically united support from foresters and forest interests. This is perhaps less unusual when one considers the lack of a truly comprehensive federal forest policy heretofore.

The need of an adequate forest policy has been officially known since 1876 when Congress first appropriated $2,000 to employ a competent man to investigate timber conditions in the United States. During the 48 years which have elapsed since then, the forest reserves have been established, the present national forest act has been passed, a well-organized Forest Service has come into being, and the Weeks law, authorizing the purchase of reservation areas at the head waters of navigable streams, has been enacted.

During the same period the forestry problem has changed from one of minor significance to one of major significance for the nation's welfare. The center of lumber production has shifted during that time from the Lake states to the South and now is shifting to the Pacific Coast. Of the original timber supply of 5,200 billion board-feet in the United States, only 2,200 billion board-feet remain. At the present time 483,000,000 acres of the original 822,000,000 acres of virgin forest is classed as forest and cut-over land. Of this, 138,000,000 acres consist of virgin timber.

The Forest Service reports that the present annual consumption and wastage of forest products is 24,785,000,000 cubic feet per annum, or 254 cubic feet per capita. Of this amount 2,380,000,000 cubic feet represent estimated loss from fire, insects, diseases, and windfall.[1] The damage caused by fires alone is estimated at an average annual figure of $16,463,241, for the seven years 1916-1922. This, of course, does not take account of the annual loss of buildings in the United States from fire, which in 1920 was estimated at $330,-

[1] See *1923 Yearbook of United States Department of Agriculture*, p. 474.

000,000. Thus, our net annual consumption is 212 cubic feet per capita compared with from 15 to 27 cubic feet per capita in some European countries.

In contrast to these consumption figures, one must consider the production of a timber crop. In this connection the Forest Service estimates that the annual rate of growth on the 264,000,000 acres of growing timber is only 24 cubic feet per acre, which is less than half the rate of growth in the well-cared-for forests of Germany, for example. The annual growth, therefore, amounts to about one-fourth of the present annual consumption. Thus, to supply our growing population with forest products will in the future require either a drastic cut in our rate of consumption or a considerable increase in our rate of timber growth. Assuming that we desire to maintain substantially our present standard of living so far as wood consumption is concerned, the forest problem is cast largely in terms of reducing the wastage from fire and disease (estimated to increase our rate of growth from 24 to 29 cubic feet per acre), eliminating so far as possible the inefficient utilization of forest products, and stimulating reforestation. To the solution of this problem the Clarke law is a distinct contribution.

The purposes which the nine sections of the Clarke law have in view are stated to be: "The protection of forest land, the reforestation of denuded areas, the extension of national forests, and other means of promoting the continuous production of timber on land chiefly suitable therefor."

Sections one to three of the law cover the controversial matter of protection of private forests. The Secretary of Agriculture, together with other appropriate officials, is authorized to recommend to the states desirable methods of fire protection. If any states are laggard at first, they may receive federal aid dollar for dollar of their own expenditure (state contributions shall include the sums required by state law from forest owners or operators). However, the sum of $2,500,000 which section three authorizes to be spent in such grants of aid is designed to cover a quarter of the total state-federal expenditure only. Progressive states are expected to meet three-quarters or more of the total expense. This estimate was based upon the fact that there are about 320,000,000 acres needing protection and that adequate protection can be given normally for 3 cents an acre per annum, or an aggregate of approximately $9,500,000. Previous to this law only $3,300,000 was spent for fire protection by federal and state governments and private owners; and nearly half of the forest area received no protection from fire.

Especially significant is the provision in section three for a study of forest taxation. Studies of forest taxation have hitherto been chiefly unofficial and for the most part inadequate. Nevertheless, such study as has been made has indicated that present methods of taxing forests tend on the whole to discourage rather than encourage timber growing. Where forests are assessed under the general property tax, annual taxes, which accumulate while the timber crop is growing to maturity, are likely to destroy the value of the crop at harvest time. When this is the result, it is easily seen why taxation discourages forest owners from reforestation. The provision for studying forest taxation is, therefore, of no little importance in planning the stimulation of the rate of growth. One hopes that this official study, when it is begun, will recognize, as a basic principle, the fact

that forest land, unlike agricultural land which produces an annual income, produces a harvest but once in 30 to 150 years.

Sections four and five of the Clarke law are concerned with direct aids to private efforts at reforestation. The strategic importance of the farm woodlot in the forestry system is given recognition by the provision for the production and distribution of seed trees. For this purpose the Federal Government is authorized to match state appropriations up to an aggregate sum of $100,000. A second $100,000 may be used for other kinds of assistance in private reforestation.

Sections six to nine apply to public forest lands. Provision is made for the acceptance of gifts of land, for additions to the forest area by purchase, for the inclusion of the uncared-for portion of the public domain within the forest system either for the protection of water flow or for protection of timber. It is proposed also to establish as national forests certain land now under governmental reservations but administered by other secretaries than the Secretary of Agriculture, if in the discretion of the secretaries concerned the primary use of this land is not impaired by timber growing.

In evaluating this law one is impressed by the fact that the act reveals a growing realization that our forests are not a resource to be exploited but a crop to be harvested. In itself this is an advance. Also, the law is evidence that forestry is becoming a matter of land economics. Although it is generally conceded that more of our forest area should be publicly owned, especially under conditions of high forest culture, we must reckon with the existing predominance of private ownership which applies to three-fourths of the present forest area. Public ownership is not ipso facto a guarantee of scientific forest management. In this connection it is significant that of the areas planted prior to January, 1923, 75% were planted by private owners. If, as the Forest Service says, the elimination of waste due to fire and disease will increase the rate of growth only 5 cubic feet an acre each year, it would seem advisable to offer greater inducements to reforestation than are provided by the law, unless we are willing to accept reduced standards of consumption. But it must be recognized that, with our high percentage of private ownership, much education both of private owners and of state officials is necessary. The basic principle of the law is to bring the laggards into line, and then go forward. With this principle and with the companion principle that the several states have an important task of education and tax reform, there will be little disagreement.

From the economic point of view the sooner we realize the importance of considering both costs and incomes in utilizing forest land the better will be the prospects of increasing the annual rate of growth; for, under private ownership, the most effective inducements to reforestation are largely those which take account of costs and incomes. One phase of this aspect of forestry is the study of forest taxation, which is provided for in the law; another is an economic survey of the land to determine the areas best suited for forest culture. The law makes a beginning toward applying economic principles to forestry. As the public is further educated in forestry problems and as the Forest Service expands its excellent work, we may look for further developments in this direction.

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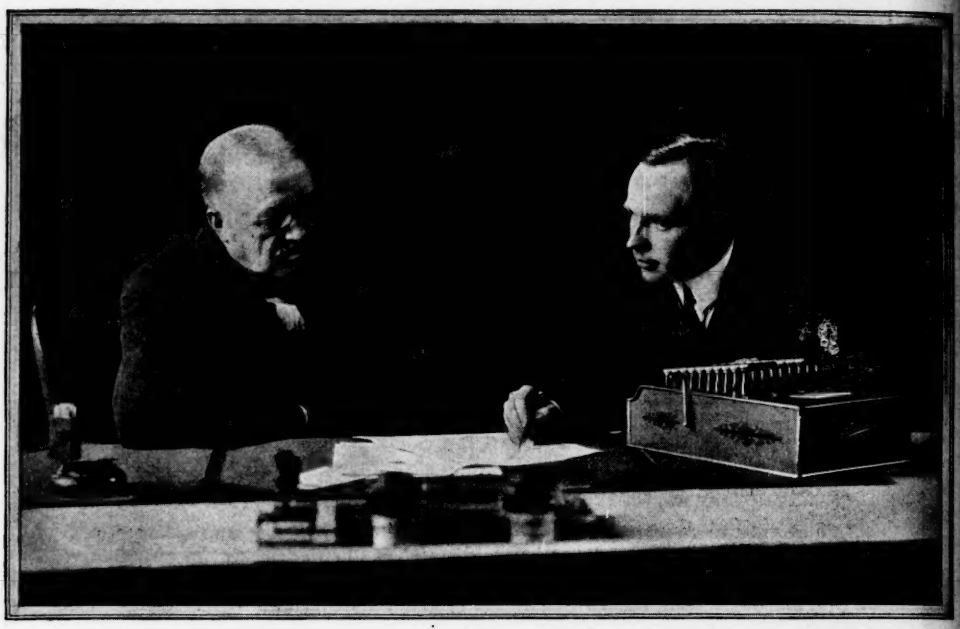

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